

Doxy-addition

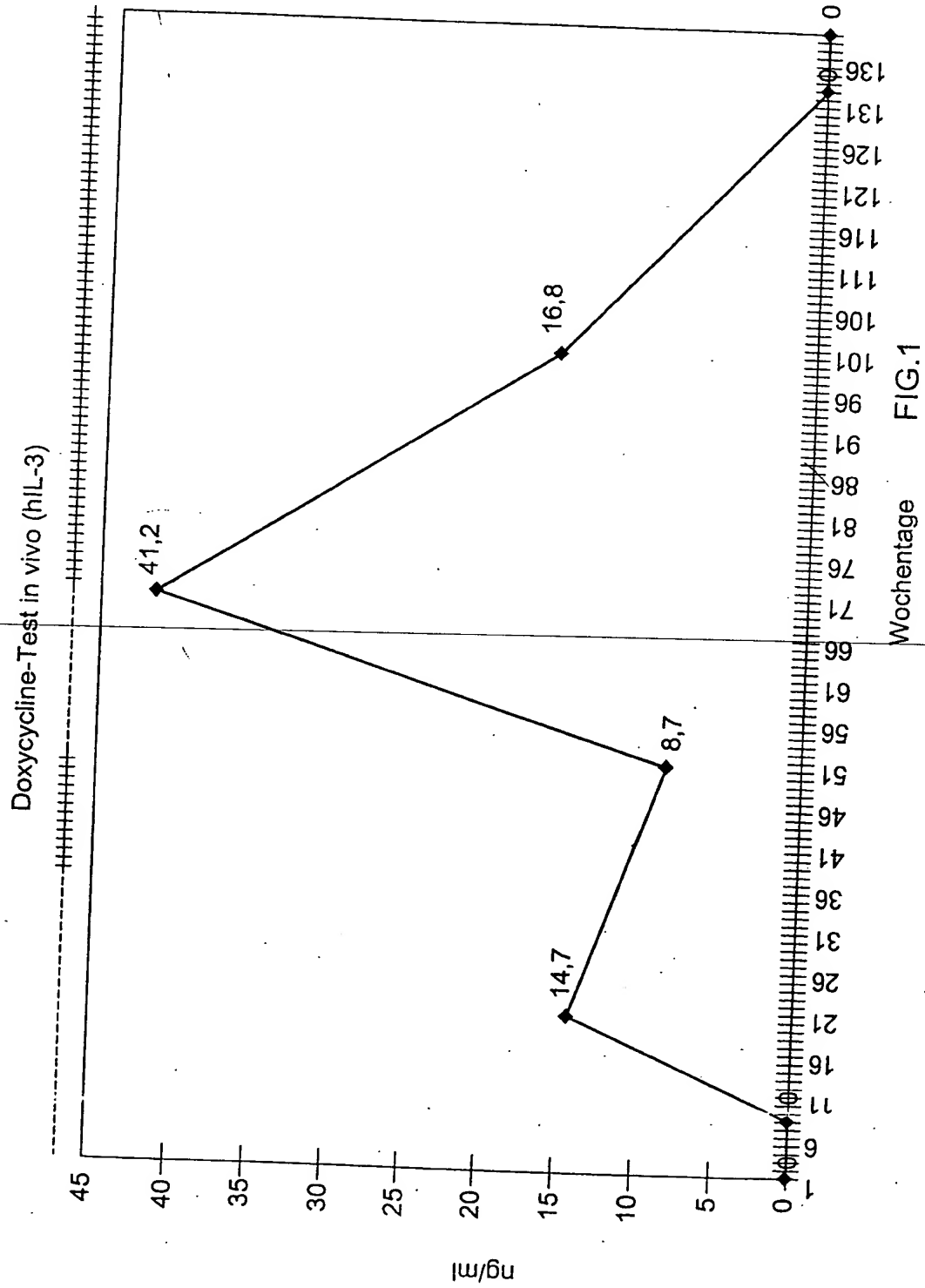
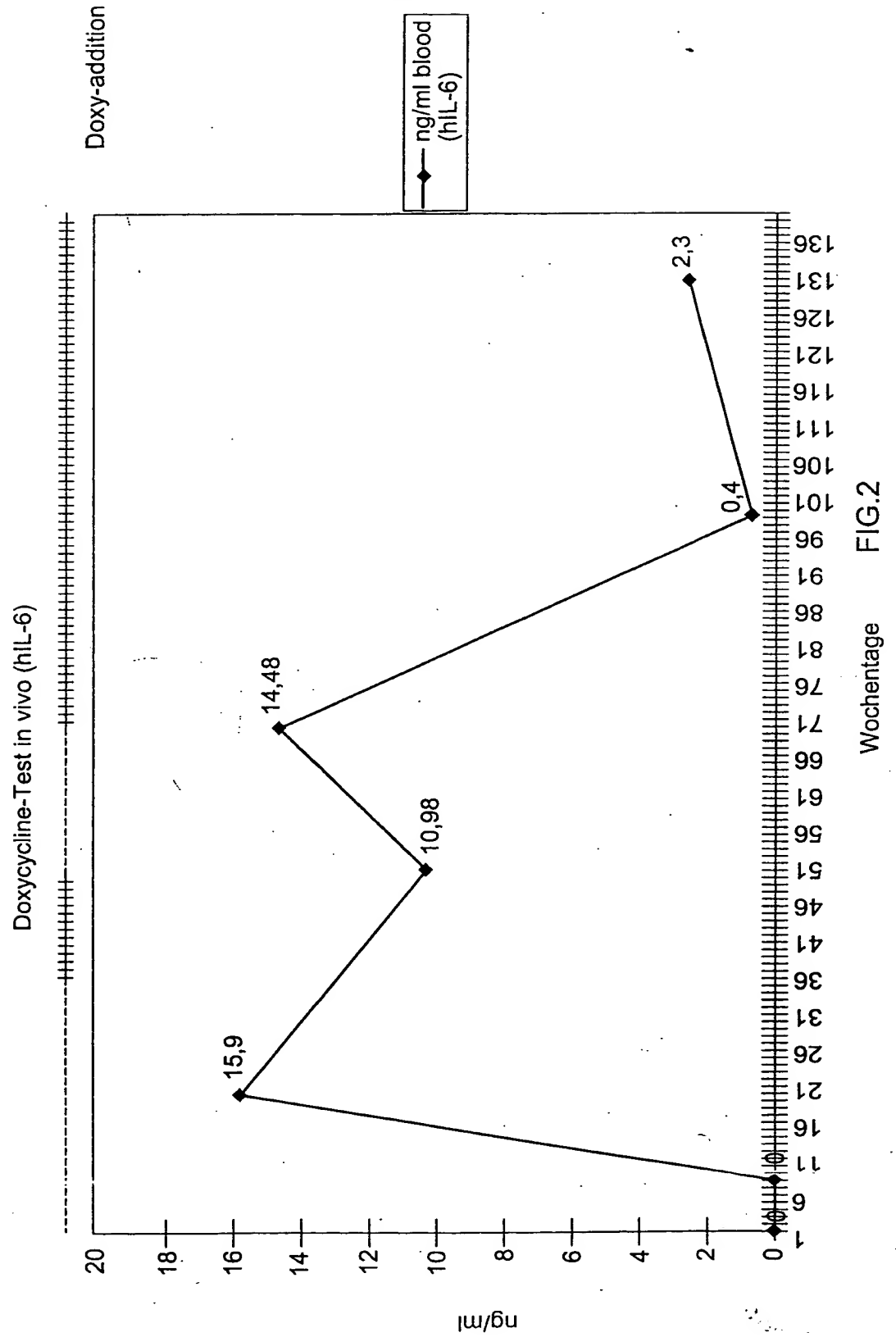


FIG.1

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Scid-mice [OG,SM,OD,SC(-):hIL-6

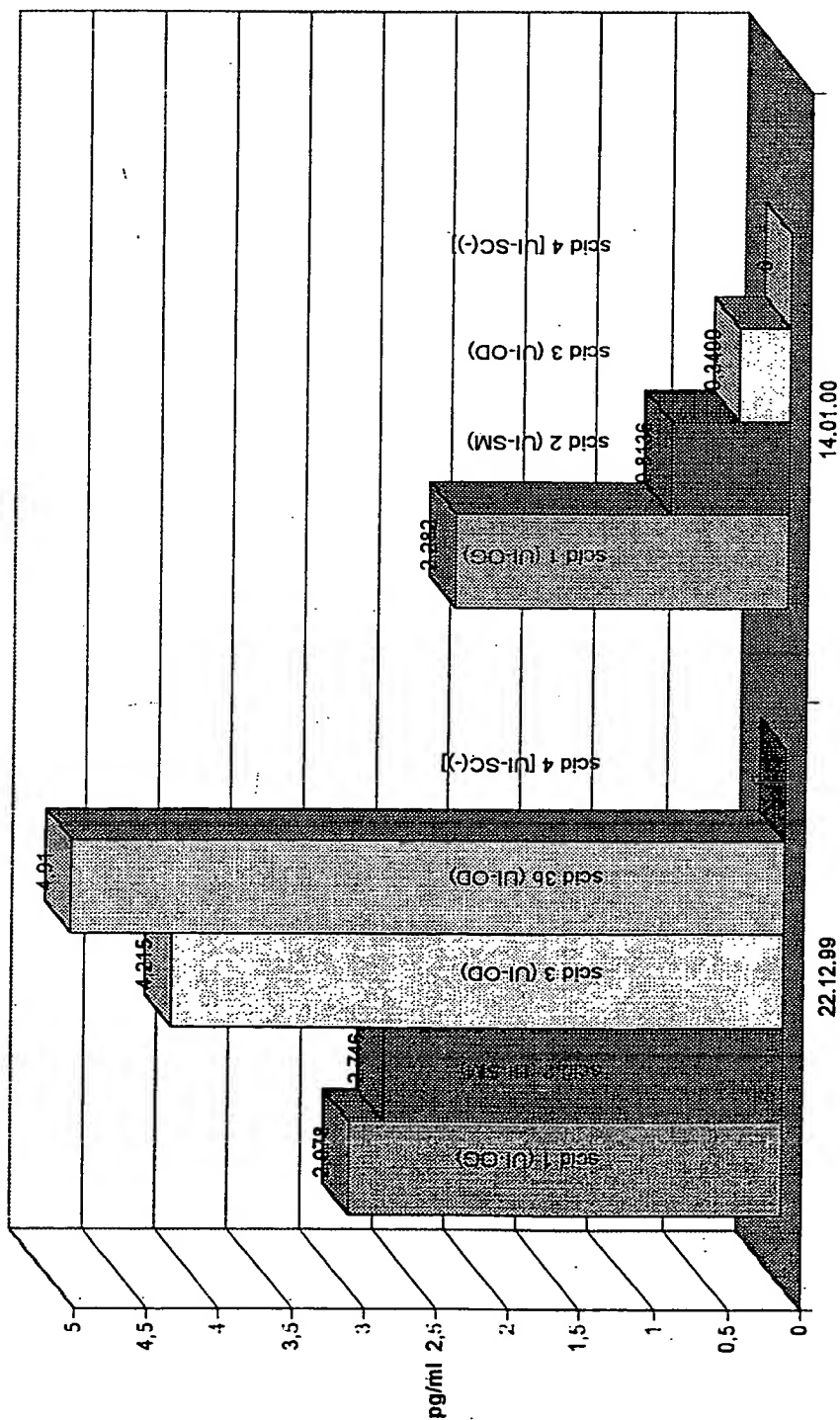
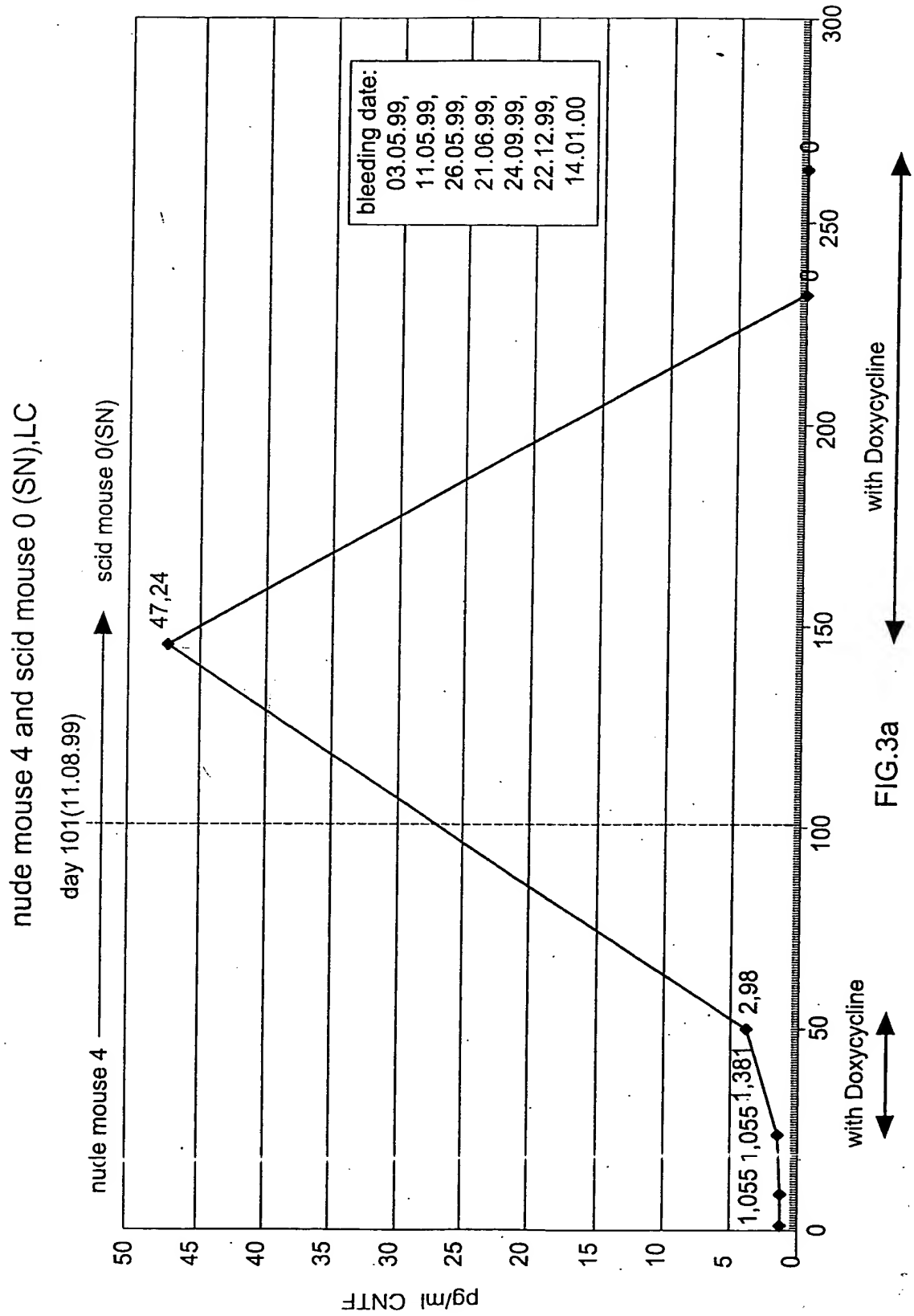
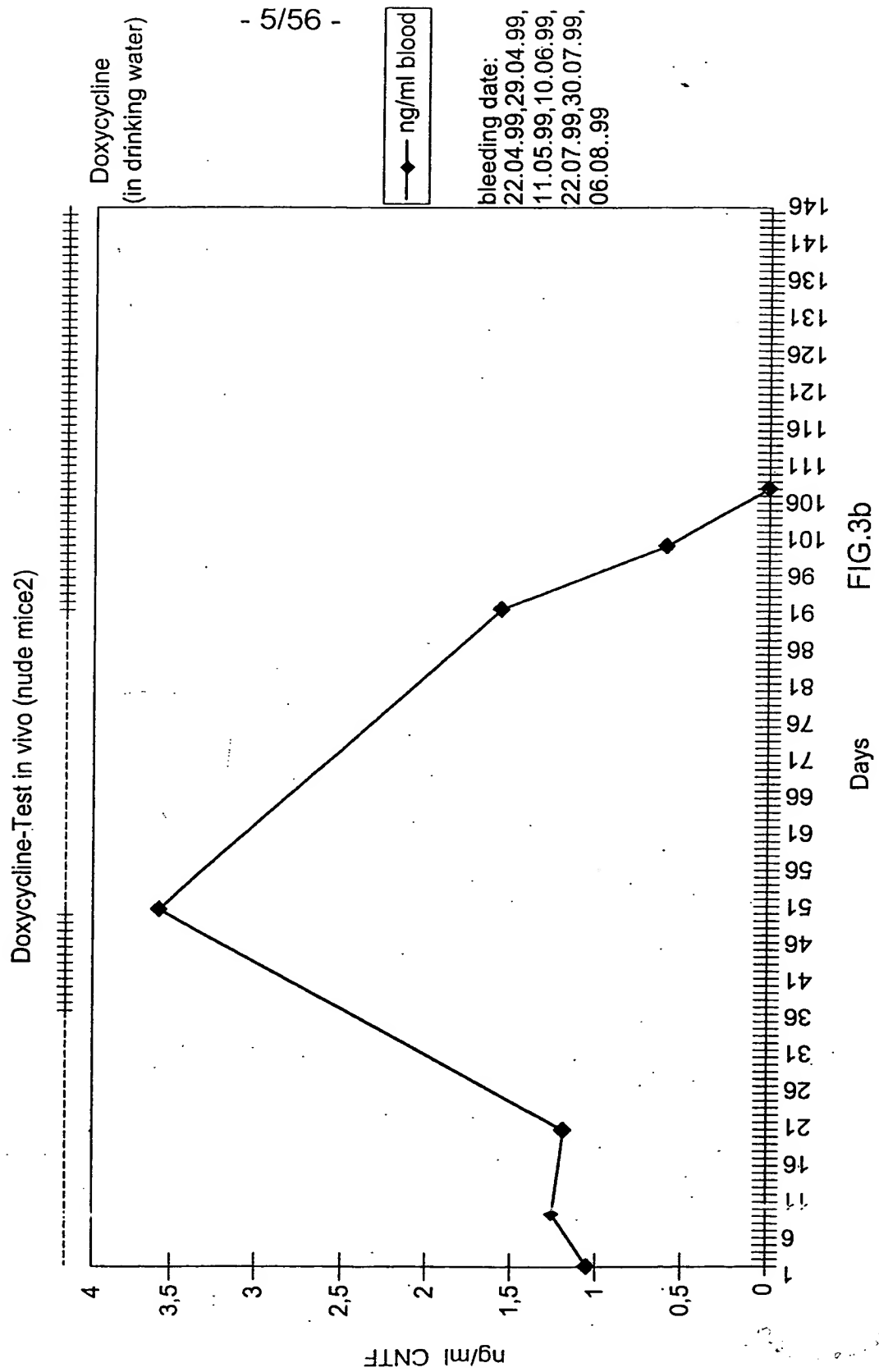


FIG.3

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## Cloning of growth factor genes

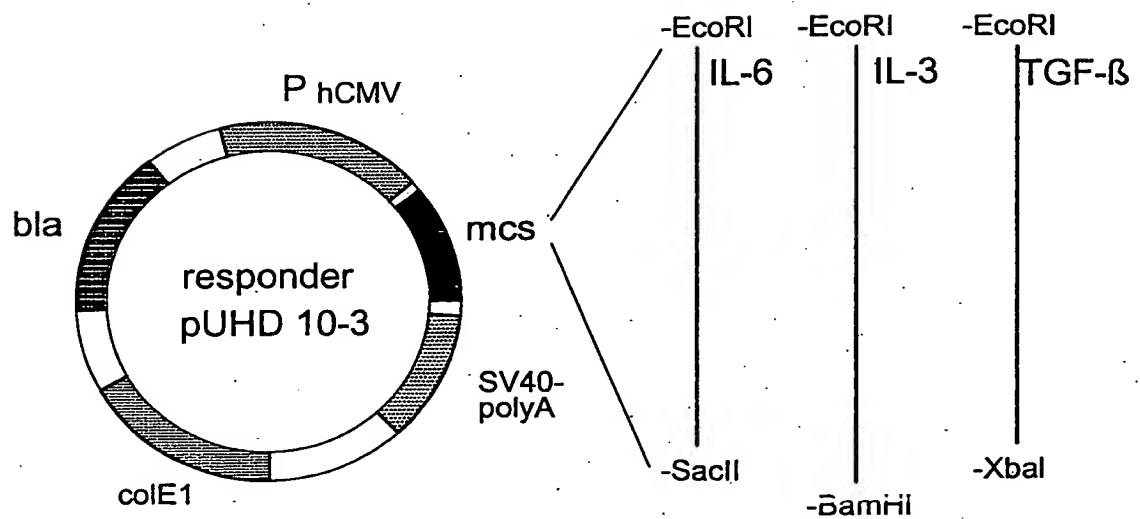
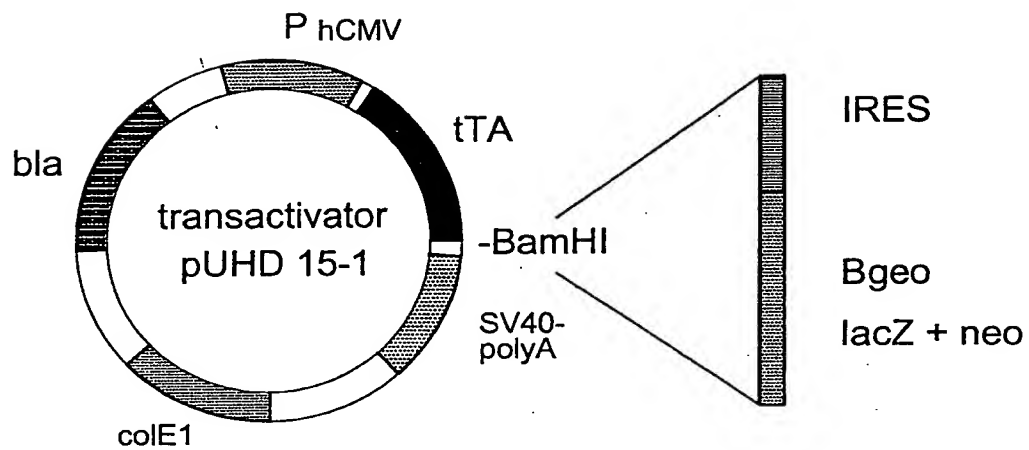


FIG.4

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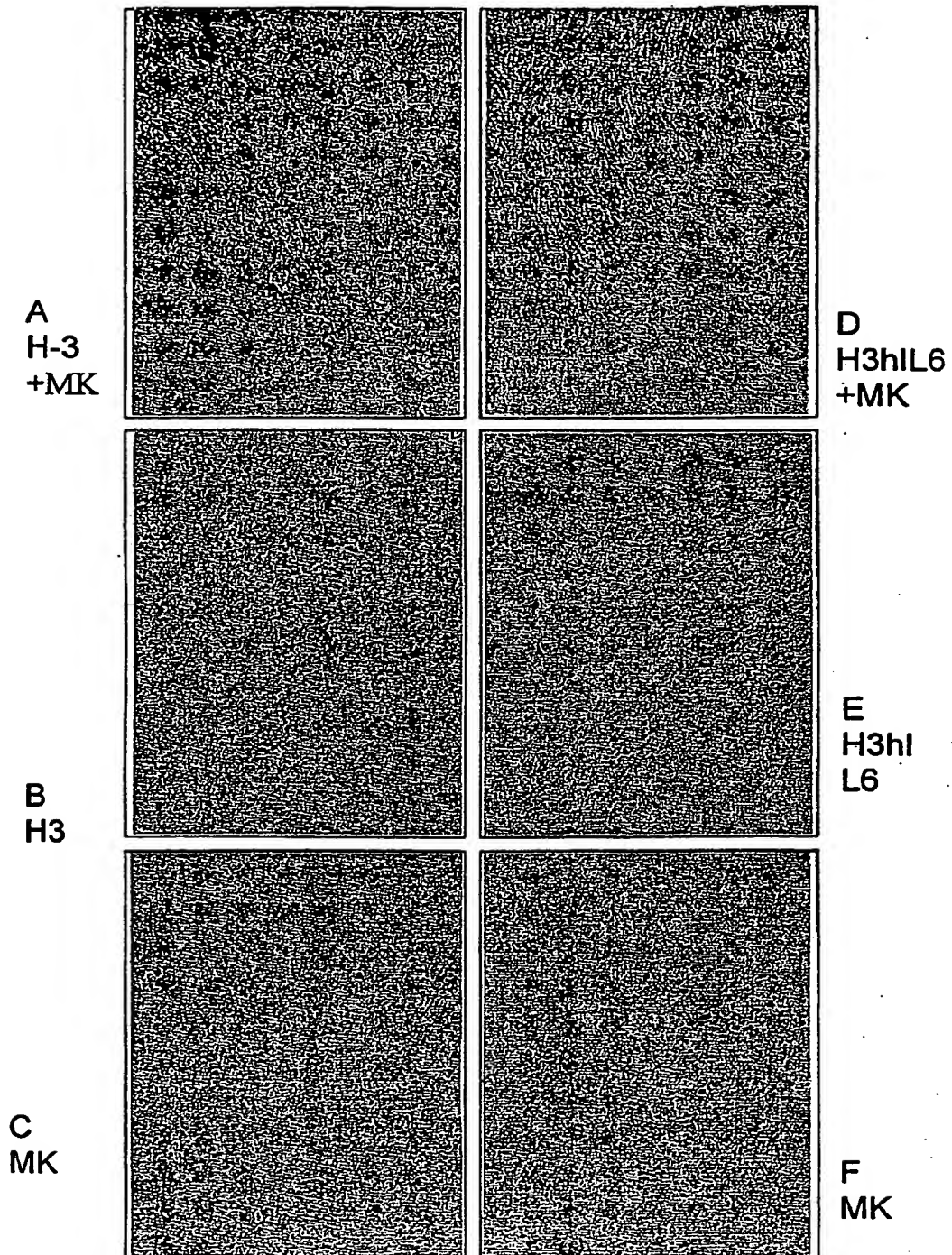
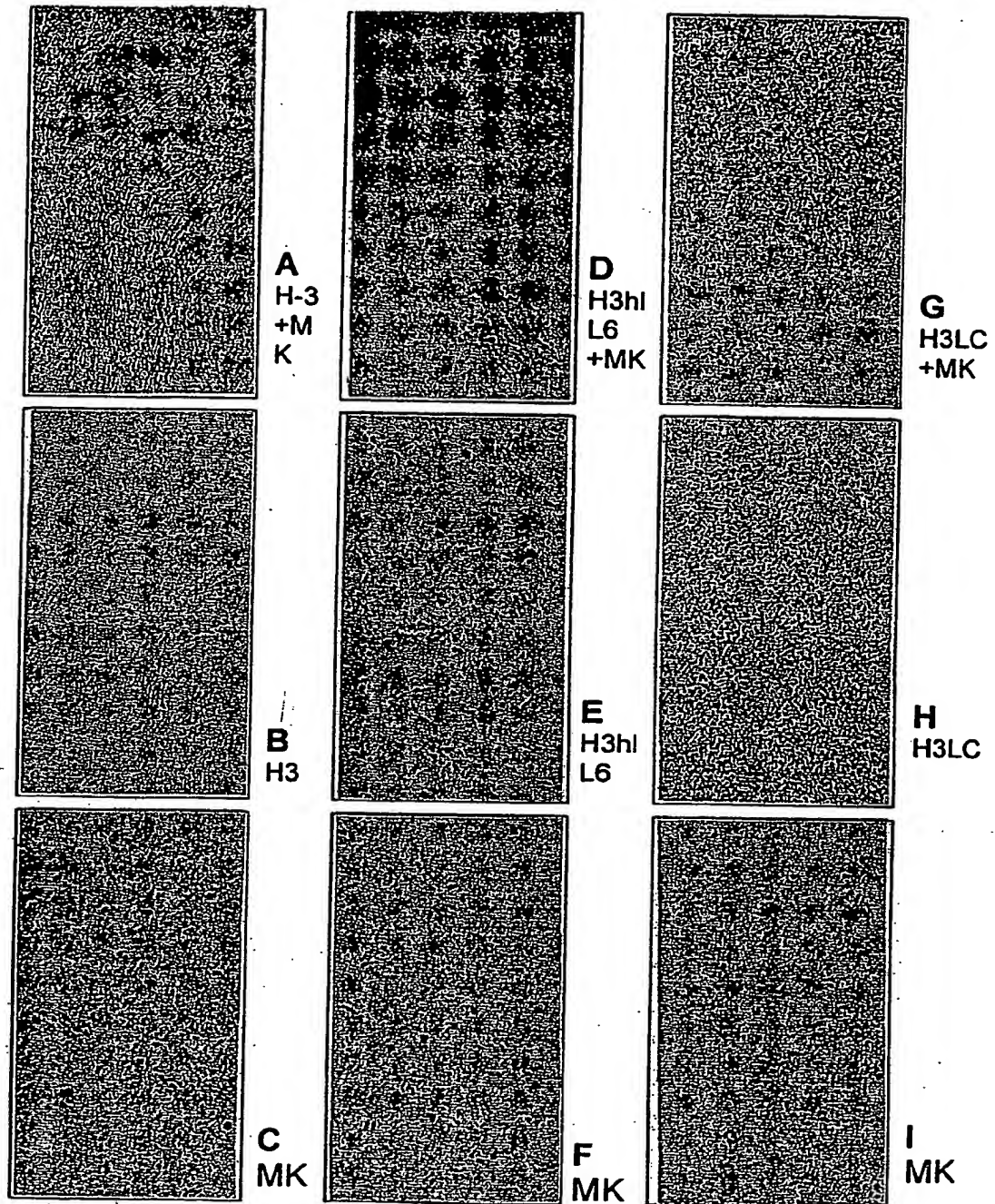


FIG.5

5wk

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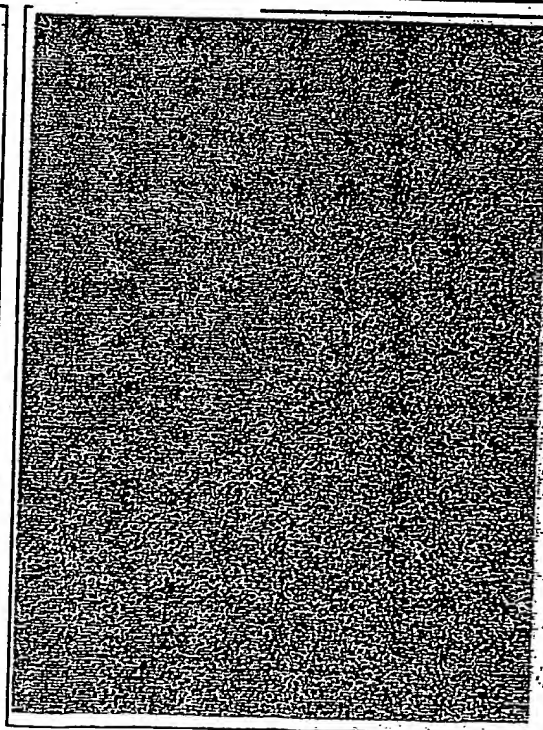
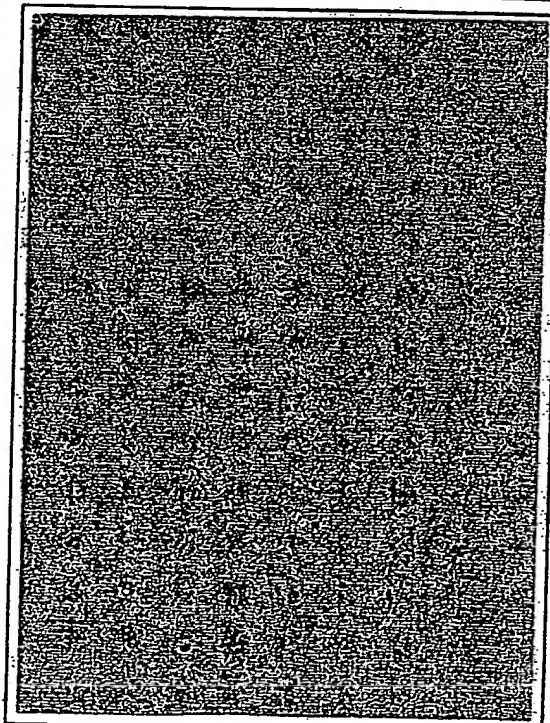
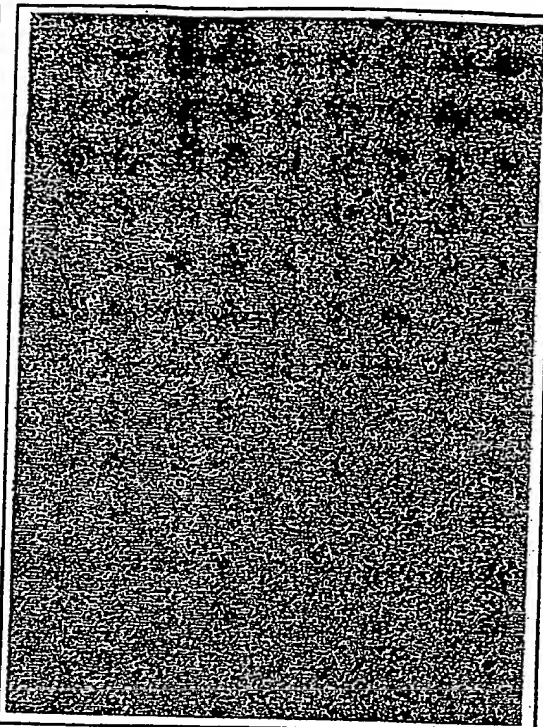
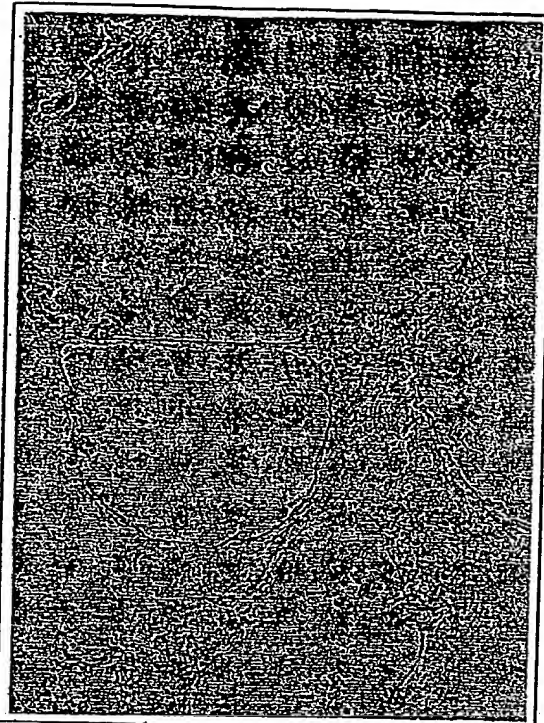
2wk

FIG.6

A.MK(MK+H3-GFP)

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B.H3-GFP(MK+H3-GFP)



C.MK alone

D.H3-GFP alone

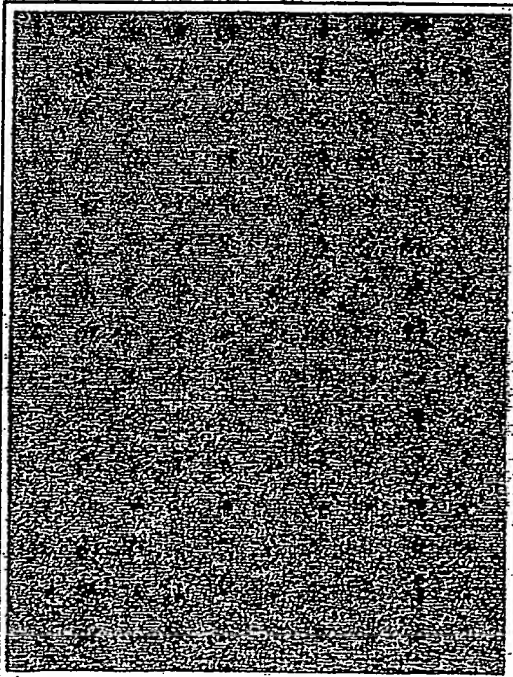
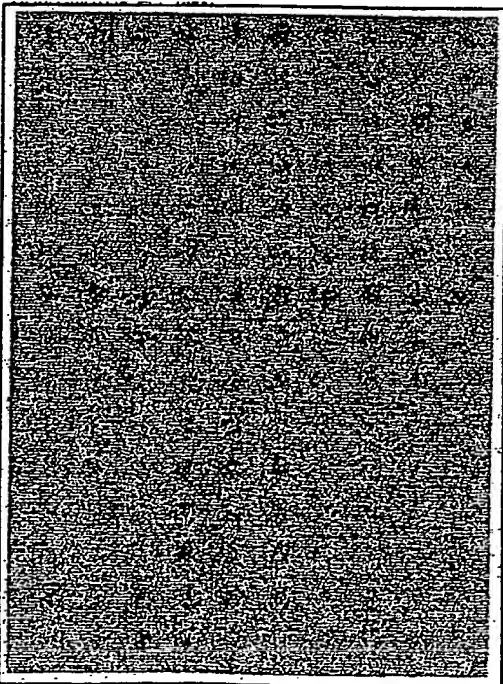
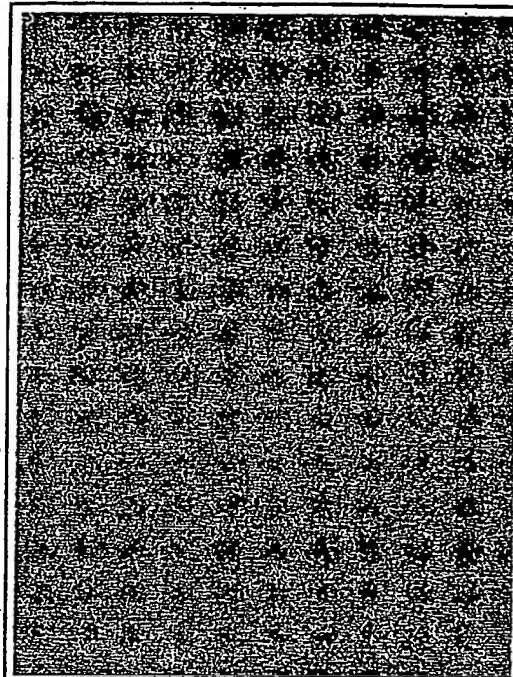
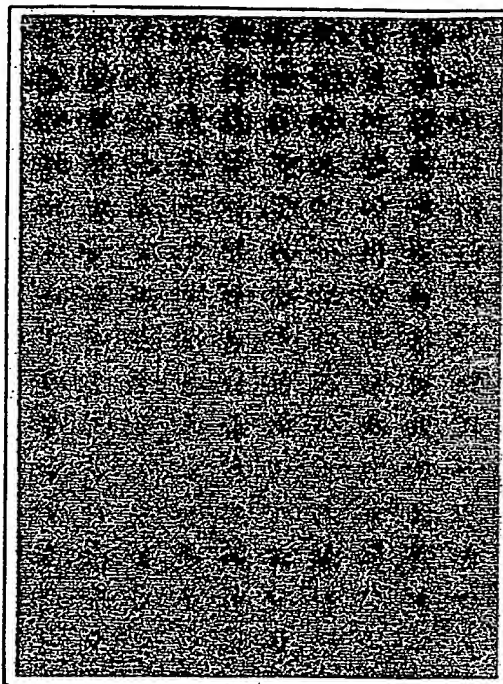
FIG.7



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A.MK (MK+H3-GFP-hIL6)

B.H3-GFP-hIL6(MK+H3-GFP-hIL6)



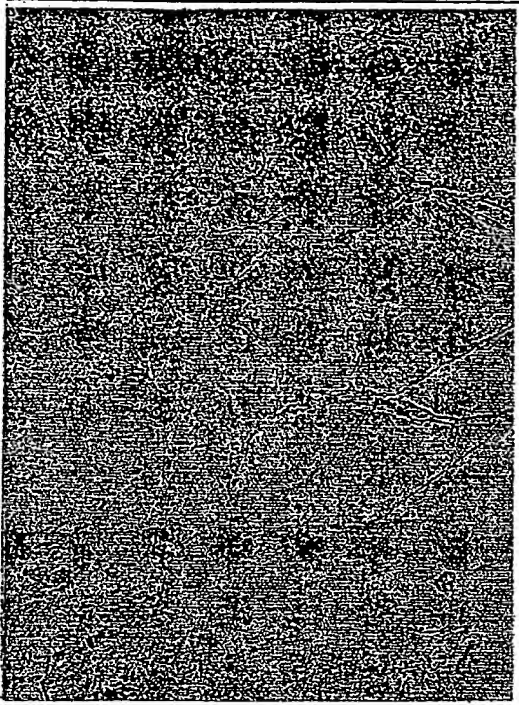
C.MK alone

D.H3-GFP-hIL6 alone

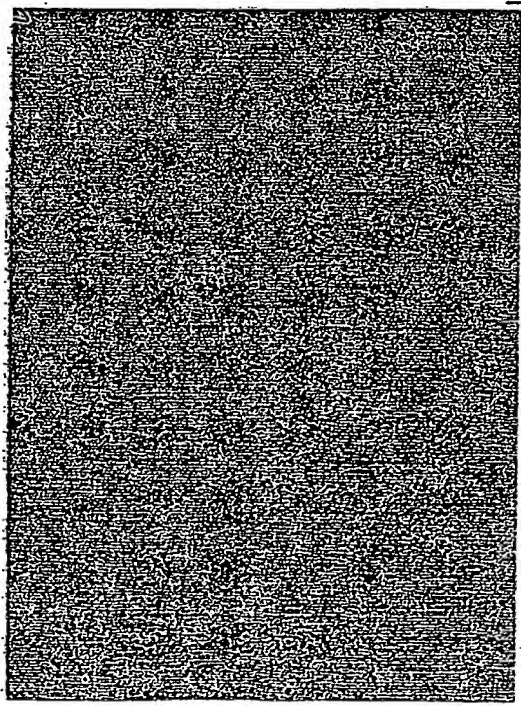
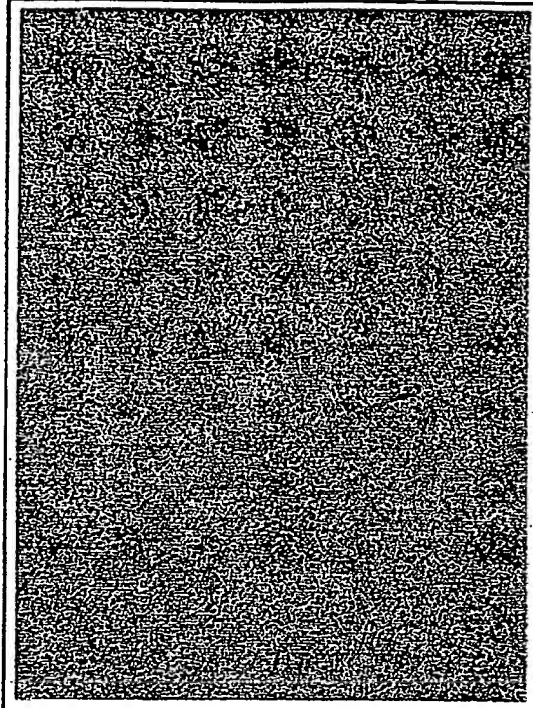
FIG.8

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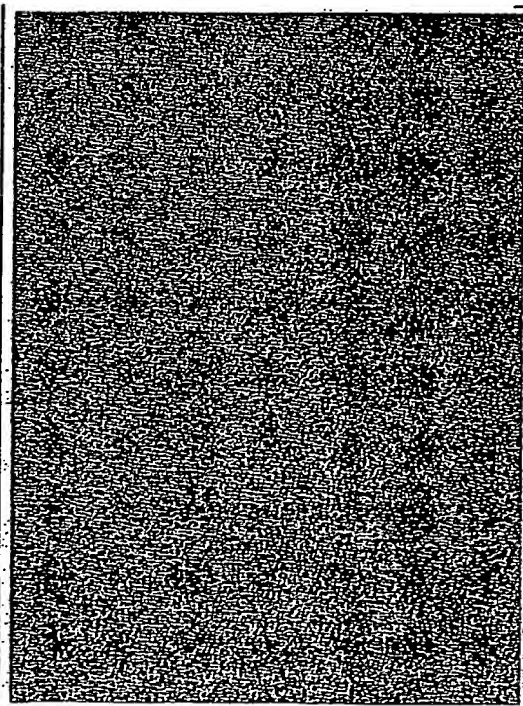
A.MK (MK+H3-LC)



B.H3-LC (MK+H3-LC)



C.MK alone



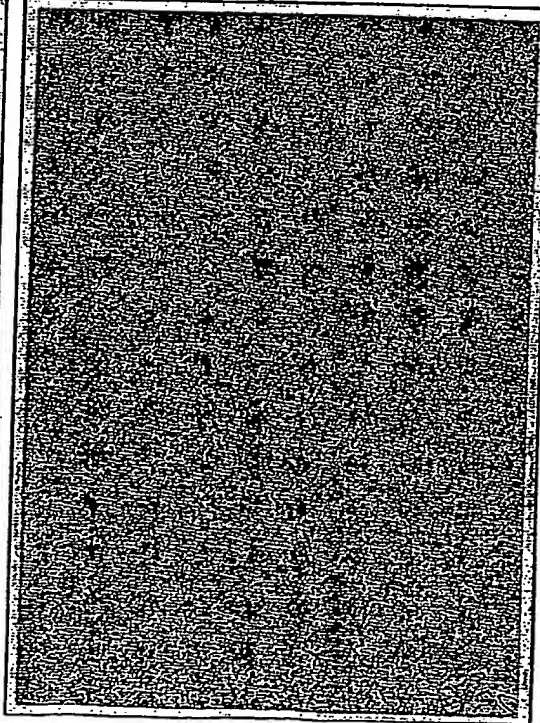
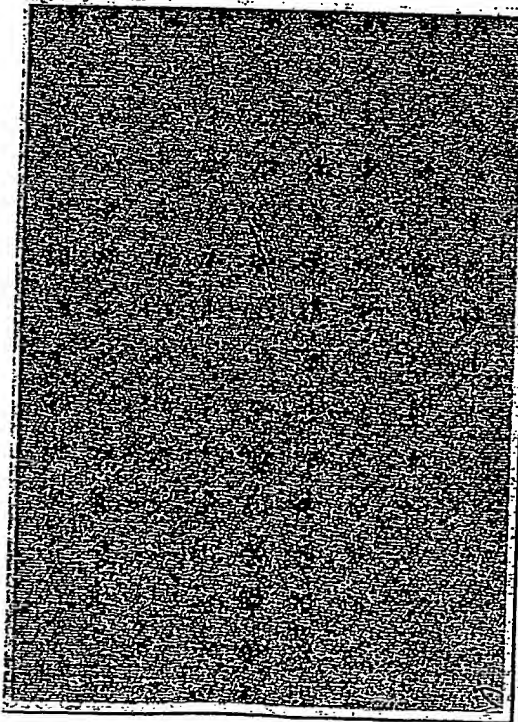
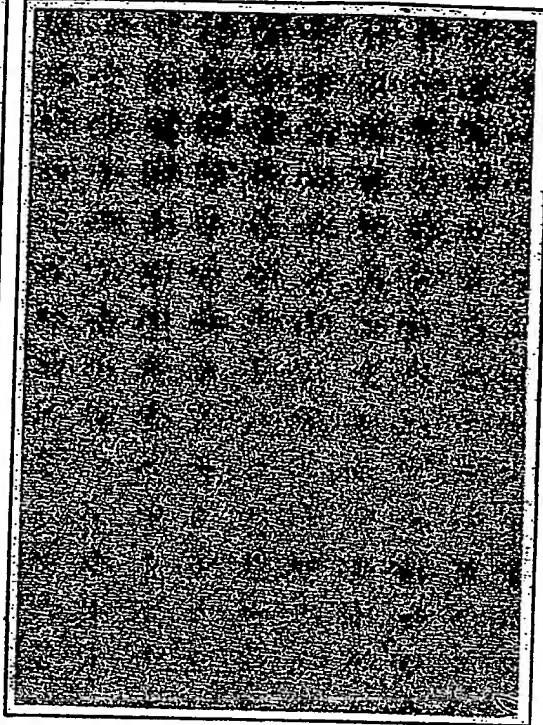
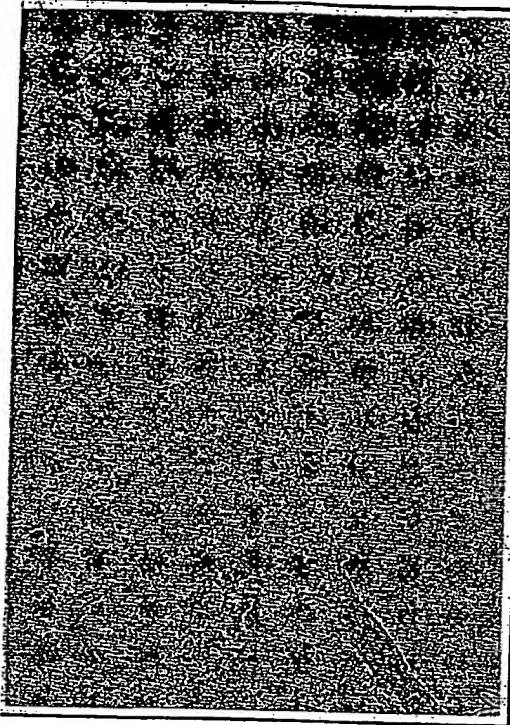
D.H3-LC alone

FIG.9

A.Sk (Sk+H3-GFP)

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B.H3-GFP (Sk+H3-GFP)



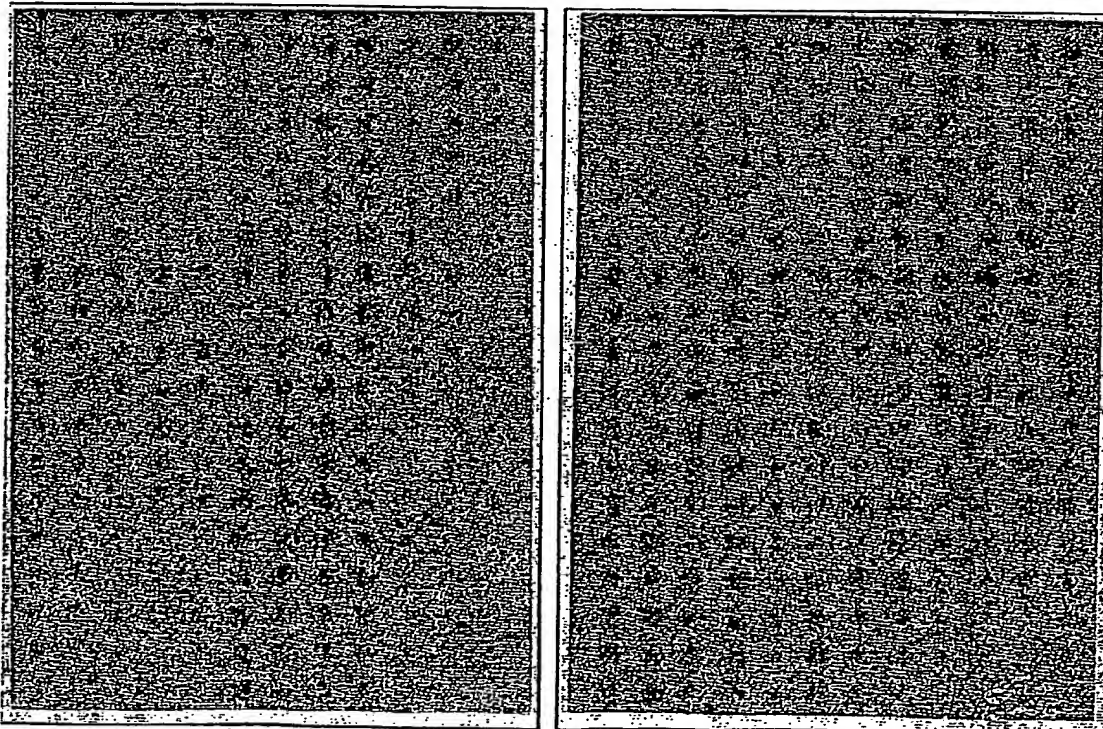
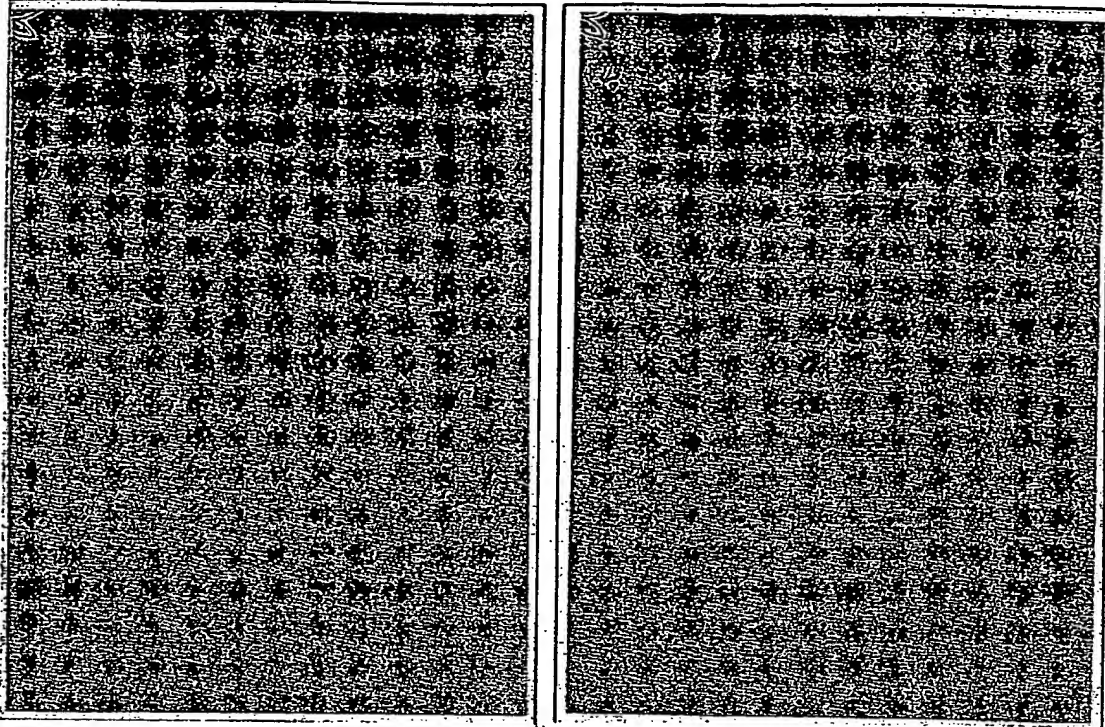
C.Sk alone

FIG.10

D.H3-GFP alone



A. SK (Sk+H3-GFP-hIL6) - 13/56 - B. H3-GFP-hIL6 (Sk+H3-GFP-hIL6)



C. Sk alone

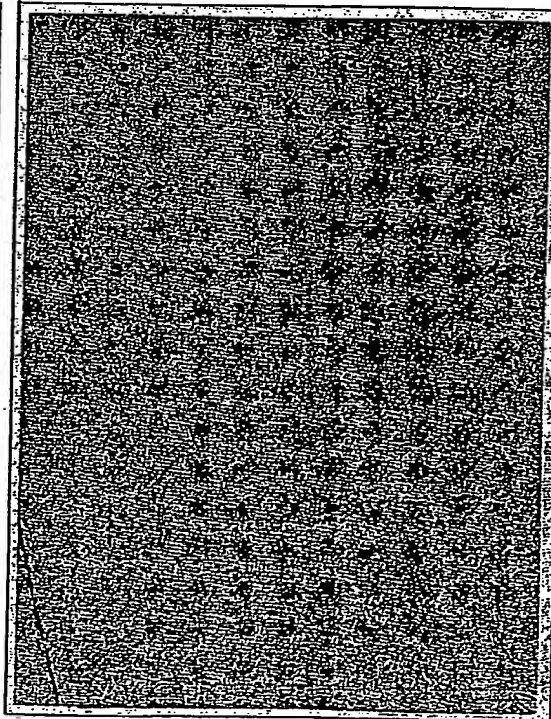
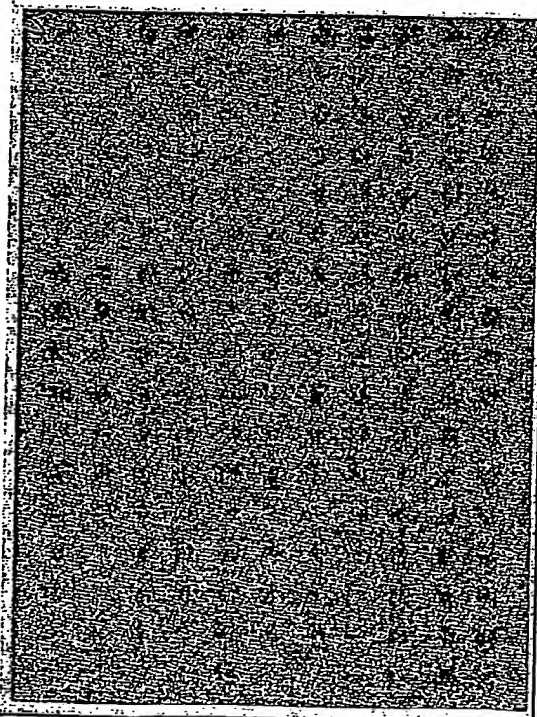
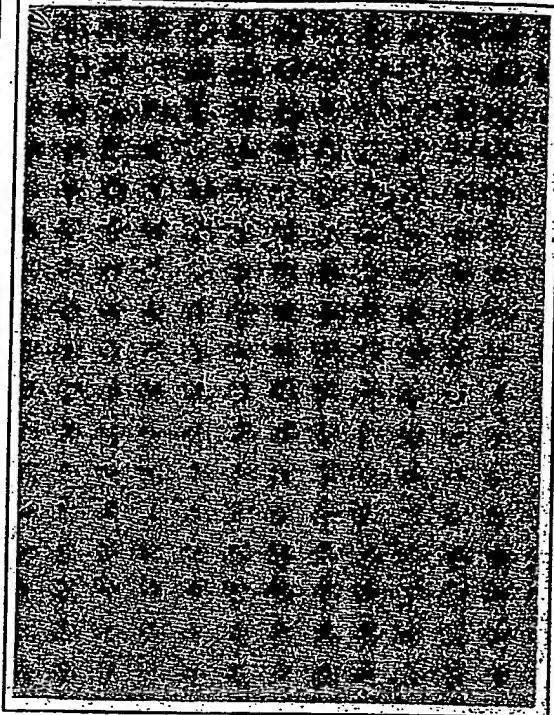
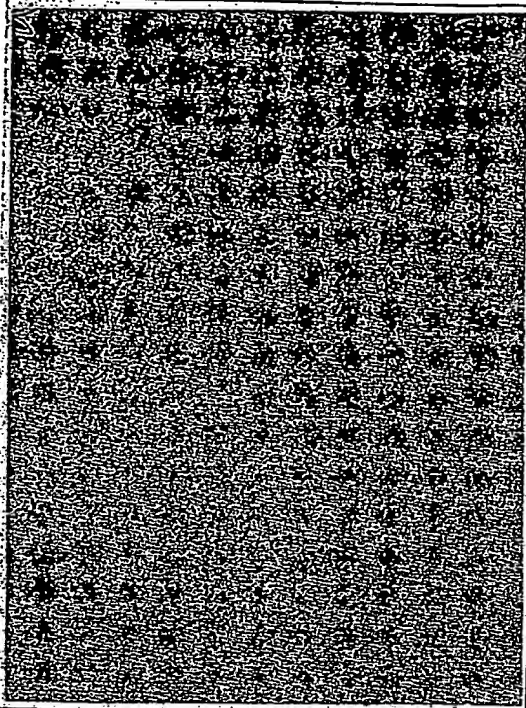
FIG. 11

D. H3-GFP-hIL6 alone

A. Sk (Sk+H3-LC)

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B. H3-LC (Sk+H3-LC)



C. Sk alone

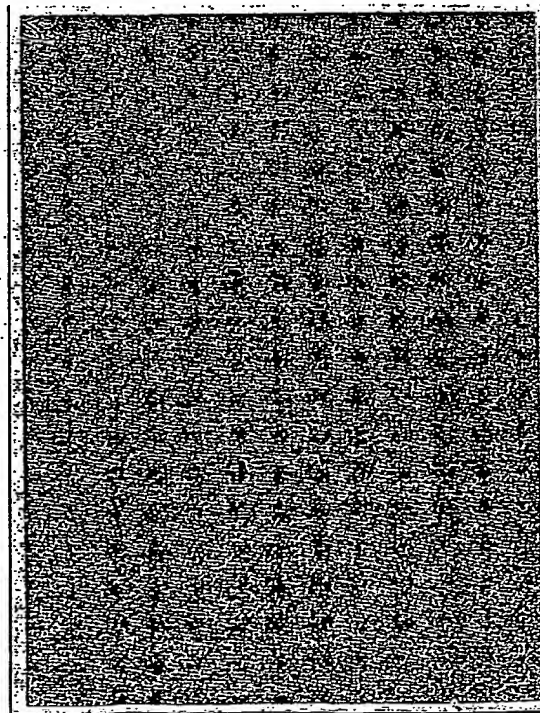
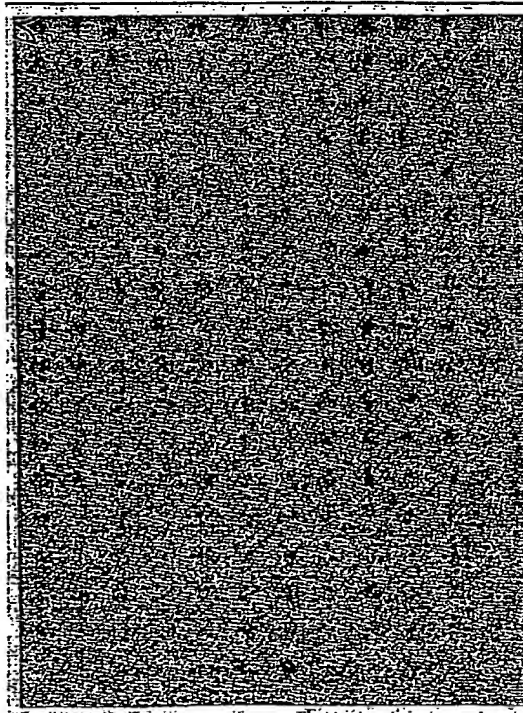
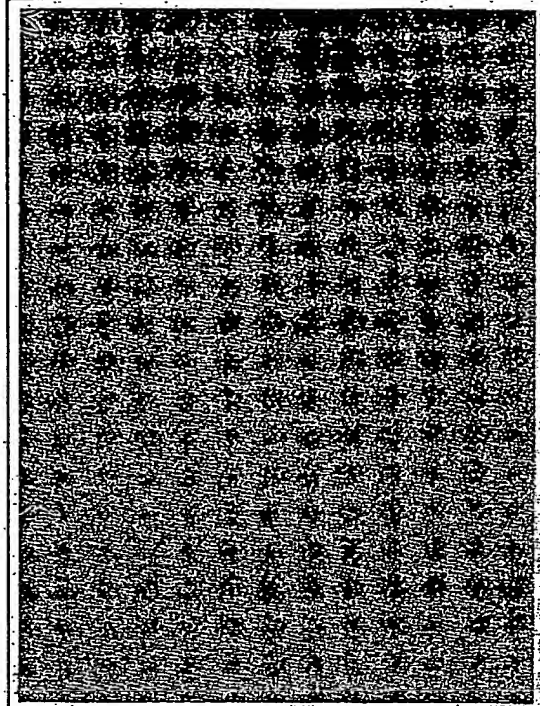
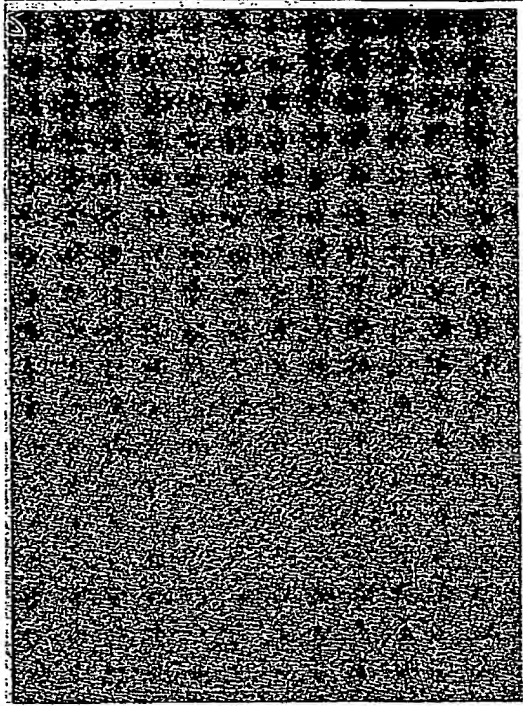
D. H3-LC alone

FIG.12

A. Sk (Sk+MK)

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B. MK (Sk+MK)



C. Sk alone

D. MK alone

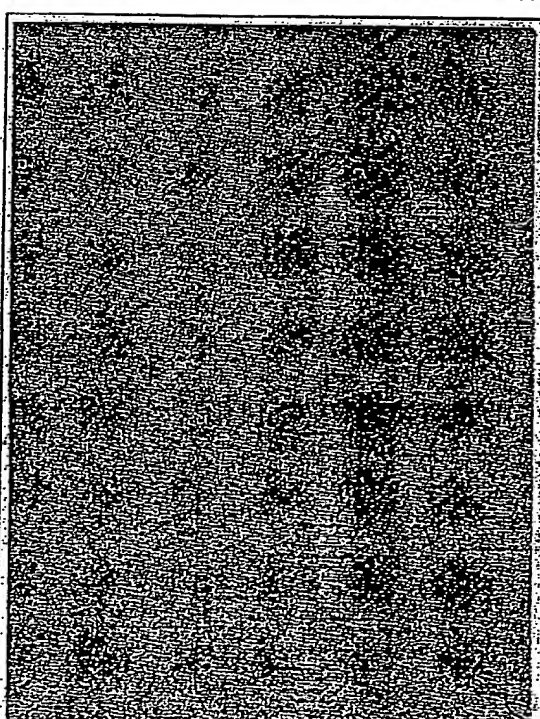
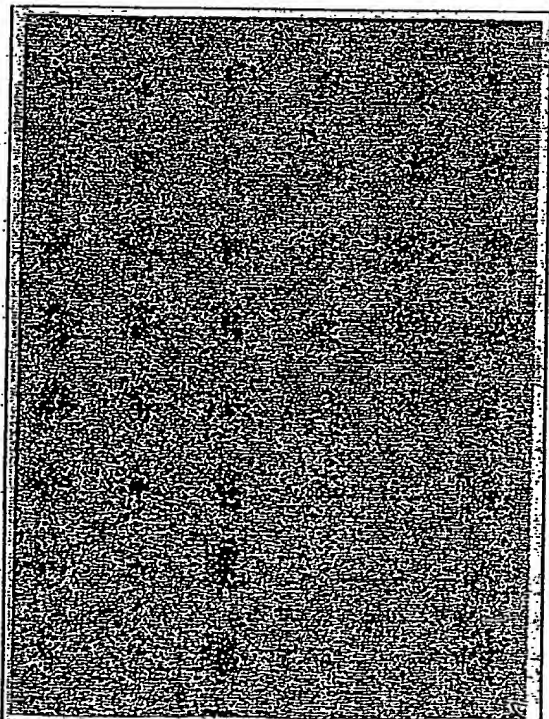
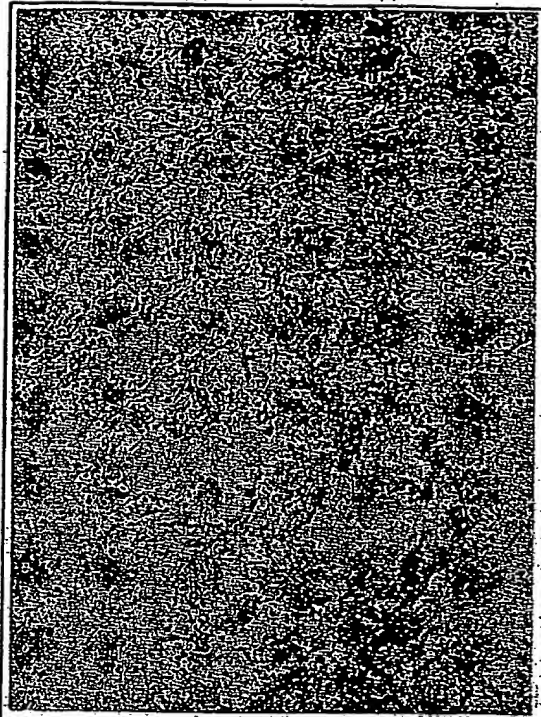
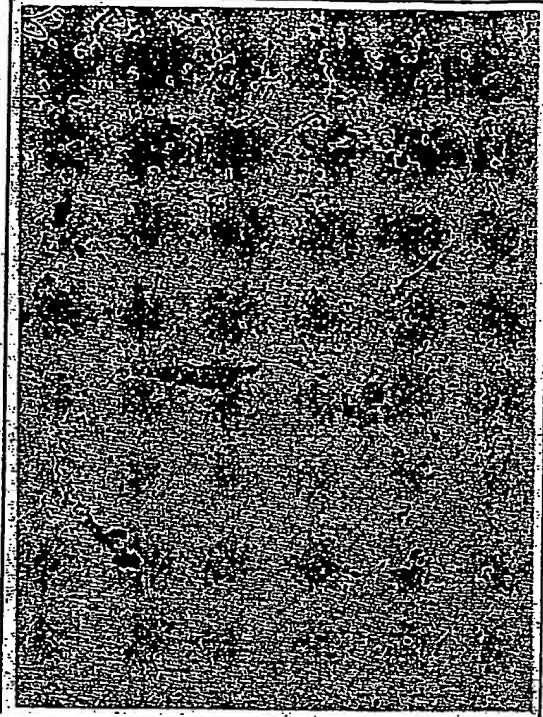
FIG.13



A. Lg (Lg+L14)

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B. L14 (Lg+L14)



C. Lg alone

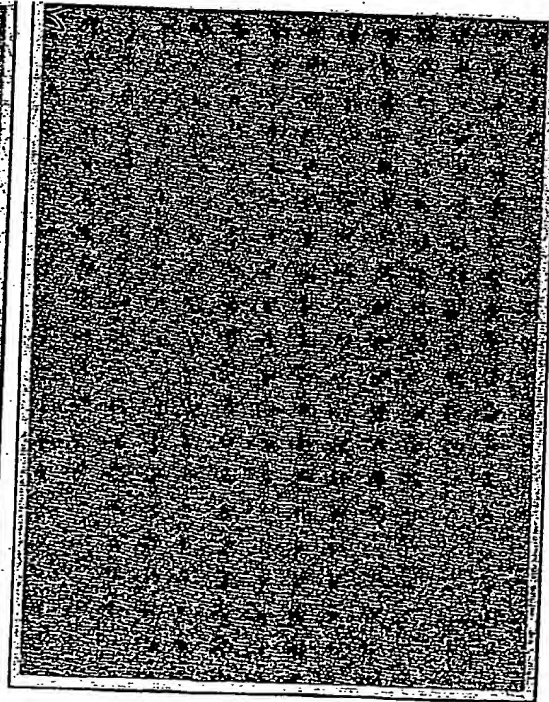
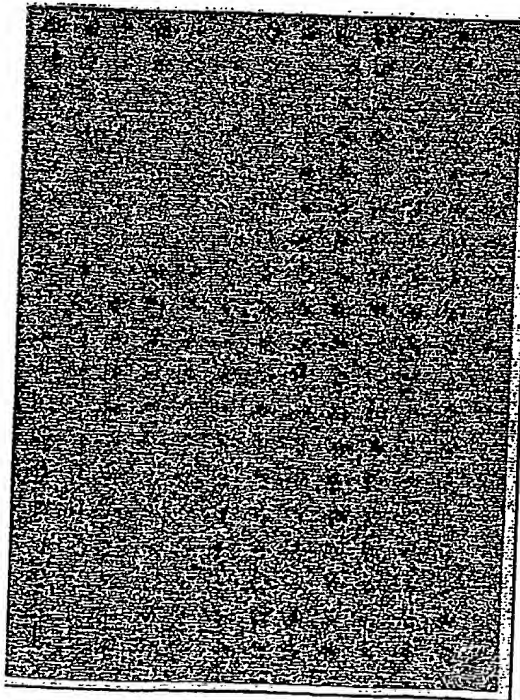
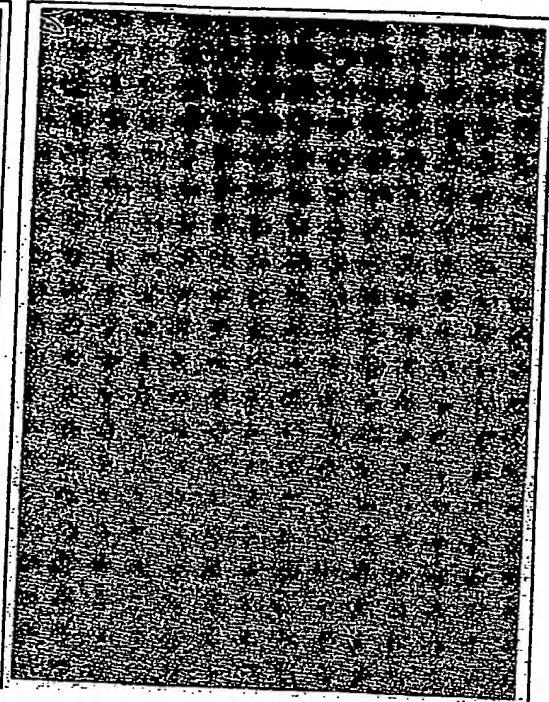
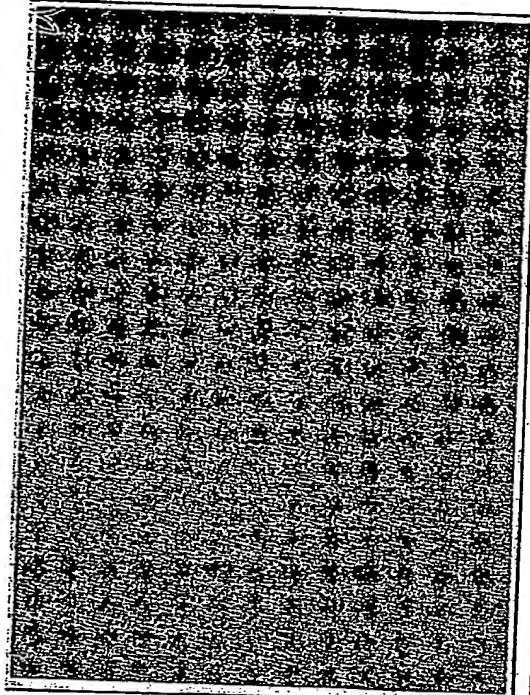
D. L14 alone

FIG. 14

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A. Lg (Lg+L14-hIL3)

B. L14-hIL3 (Lg+L14-hIL3)



C. Lg alone

D. L14-hIL3 alone

FIG. 15

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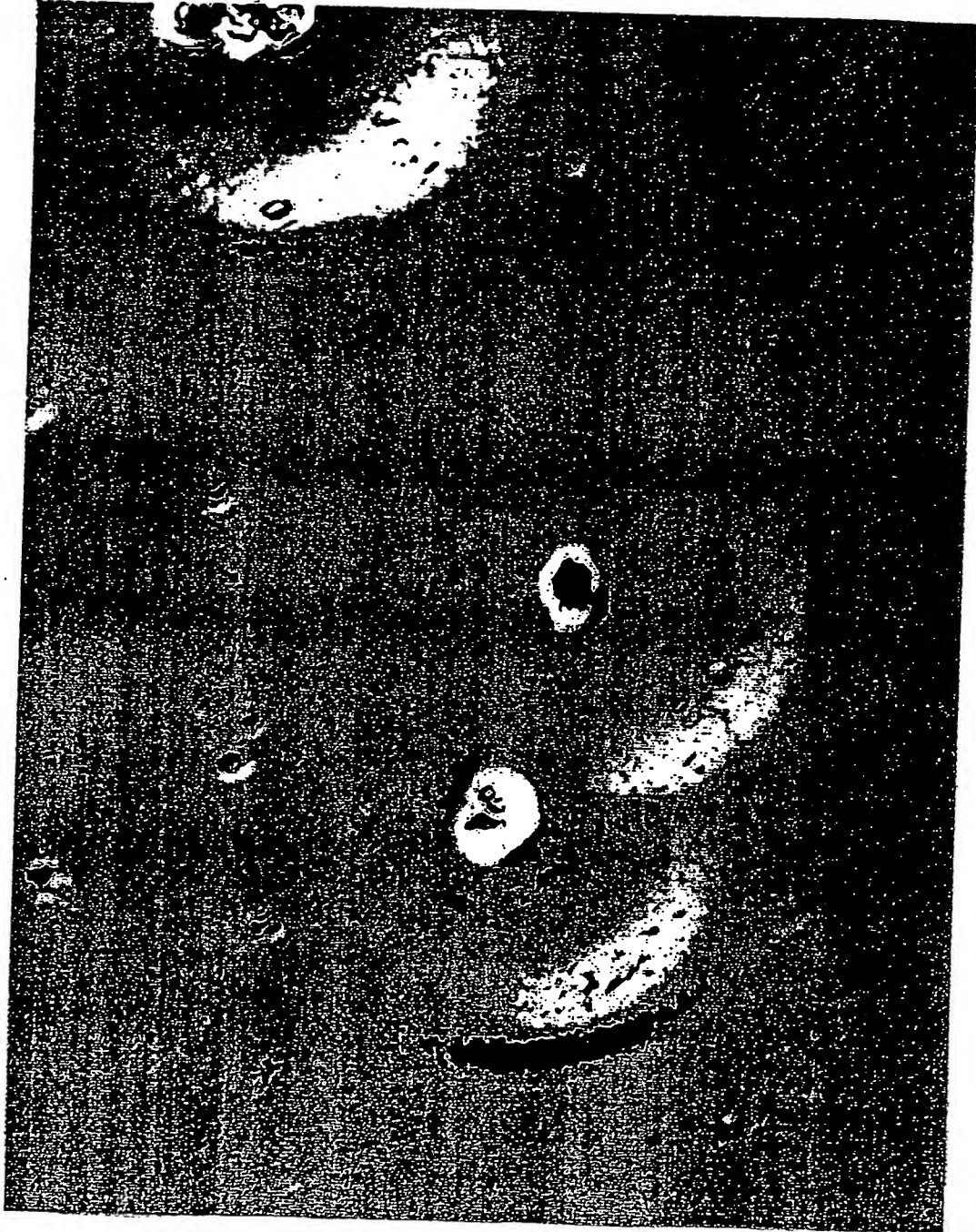


FIG.16

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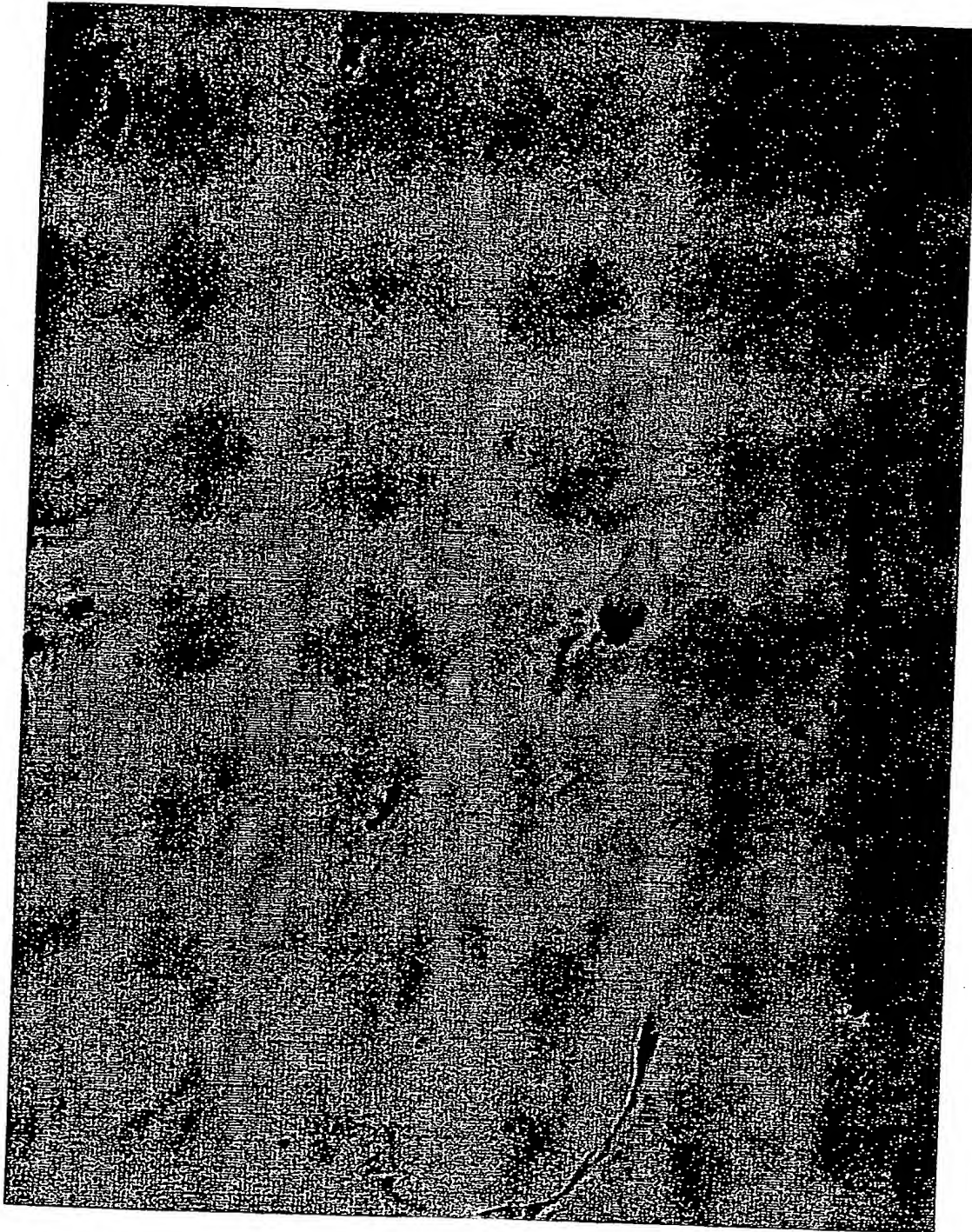


Fig. 17.



pD12JCVPlong-hCNTF

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Length: 7969 July 22, 1999

1 GCTAGCGATT TAGGTGACAC TATAGAATAG ATCtcgacnn nGTCACCCCT  
51 AGAGTCGAGC TGTGACGGTC CTTACAATGA AATGCANCTG GGTATCTTC  
101 TTCCTGATGG CAGGGGTTAC AGGTAAGGGG CTCCCAAGTC CCAAACCTGA  
151 GGGTCCATAA ACTCTGTGAC AGTGGCAATC ACTTTGCCTT TCTTTCTACA  
201 GGGGTGAATT CGGCTTTCAC AGAGCATTCA CCGCTGACCC CTCACCGTCG  
251 GGACCTCTGT AGCCGCTCTA TCTGGCTAGC AAGGAAGATT CGTTCAGACC  
301 TTGACTGCTC TTACGGAATC CTATGTAAGT TGCCTATTTT GCTGTTATCT  
351 GTTTTCCCTT CATCTTTTTT GATCCAGCAA CTTACCATCA CGCATCAGCT  
401 CCATTACCAA TTGTGAAAGC TCTAATCATA TAGTCATTCA TATAGGTTAT  
451 TTGACATGGG CCCTTCCCTT GAGGAAACCC ATGTGACTTT ATTTTCTTCC  
501 TCTGGGCTGT TTAGGAGATG AAGTTACTTG AATGAGAAAA TATATATGGA  
551 GTTCTAGAAA GGATTGGTTT ATATGTCTTG GAGGCTATTT CAAAATTTAT  
601 TTGGCCATAT ATTCTGAATA CTACCTAGAA CAGATTAGCC ATGGGCCCTN  
651 TGGGTNTTTC ATAAGCCATT GTTCTGAANT TTTTITAGCTT TGTAATGAA  
701 AGGTTTATGG GATAGGAAGA GTNCTATGAA CGTGGGAGGA ATTTGTAAAT  
751 CCTACCAATT TNTNCTATAT AGCATTAGCC CCCACCTTTT ANTATTCTGC  
801 ATCAAAAGTA AGATTGTGTC TAAAGAGAAA GGTNAGCTAT CAAAGGACT  
851 CCTATAANAT TCNTTGGAAA CTNTTGGGAAN TGTCAAATTT NTTTGAGCTA  
901 ATNTTGGAG TTCCAAANTT TGTCTTNTNA CAGTNAAGGG GGANCCCCAT  
951 TCANATTTNC CCCCCTNNNG ANAATGCTTG GGGGAAAAAA CCTNCCAACC  
1001 CCNTTGTGGG ANGAAGTTTT TTTAANNITT TAAGGCTNGN NGAAACNGGN  
1051 TTTTAATTTT TTGGGNCNAN CGCCTNTCCC CGGTACCAGG AAAATCAGGA  
1101 CCTNTTTTTG GGGNNGNGCN CCNACNGGGG GGNAAAANGG GAAATTTCNT  
1151 CANAAAAAAT CTTTTCCGnn nnnngtgaag catcagggcc tgaacaagaa  
1201 catcaacctg gactctgcgg atgggatgcc agtggcaagc actgatcagt  
1251 ggagtgagct gaccgaggca gagcgactcc aagagaacct tcaagcttat



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1301 cgtaccttcc atgttttgtt ggccaggctc ttagaagacc agcaggtgca  
 1351 ttttacccca accgaagggtg acttccatca agctatacat acccttcttc  
 1401 tccaagtcgc tgcctttgca taccagatag aggagttaat gatactcctg  
 1451 gaatacaaga tcccccgcaa tgaggctgat gggatgccta ttaatgttgg  
 1501 agatgggtggt ctctttgaga agaagctgtg gggcctaaag gtgctgcagg  
 1551 agctttcaca gtggacagta aggtccatcc atgaccttcg tttcatttct  
 1601 tctcatcaga ctgggatccc agcacgtggg agccattata ttgctaacaa  
 1651 caagaaaatg tagnnnnngc ggccTGC GCC GTCTTTCCCG ACGTTAAAGG  
 1701 GATGAAACCA CAAGACTTAC CTTGCTCGG AAGTAAAACG ACAAACACAC  
 1751 ACAGTTTTGC CCGTTTTTCAT GAGAAATGGG ACGTCTGCGC ACGAAACGCG  
 1801 CCGTCTGCTTG AGGAGGACTT GTACAAACAC GATCTATGCA GGTTCCTCCA  
 1851 ACTGACACAA ACCGTGCAAC TTGAAACTCC GCCTGGTCTT TCCAGGTCTA  
 1901 GAGGGGTAAC ATTTTGTACT GTGTTTGA CTACGCTCGA TCCACTAGCG  
 1951 AGTGTTAGTA GCGGTACTGC TGTCTCGTAG CGGAGCATGT TGGCCGTGGG  
 2001 AACACCTCCT TGGTAACAAG GACCCACGGG GCCGAAAGCC ATGTCCTAAC  
 2051 GGACCCAACA TGTGTGCAAC CCCAGCACGG CAGCTTTACT GTGAAACCCA  
 2101 CTTCAAGGTG ACATTGATAC TGGTACTCAA AACTGGTGA CAGGCTAAGG  
 2151 ATGCCCTTCA GGTACCCCGA GGTACAAGC GAACTCGGG ATCTGAGAAG  
 2201 GGGACTGGGA CTTCTTTAAA GTGCCAGTT TAAAAGCTT CTACGCCTGA  
 2251 ATAGGTGACC GGAGGCCGGC ACCTTTCCTT TTATAACCAC TGAACACATG  
 2301 GAAGACGCCA AAAACATAAA GAAAGGCCCG GCGCCATTCT ATCCTCTAGA  
 2351 GGATGGAACC GCTGGAGAGC AACTGCATAA GGCTATGAAG AGATACGCCC  
 2401 TGGTTCCTGG AACAATTGCT TTTACAGATG CACATATCGA GGTGAACATC  
 2451 ACGTACGCGG AATACTTCGA AATGTCCGTT CGGTTGGCAG AAGCTATGAA  
 2501 ACCATATGGG CTGAATACAA ATCACAGAAT CGTCGTATGC AGTGAAAAC  
 2551 CTCTTCAATT CTTTATGCCG GTGTTGGGCG CGTTATTTAT CGGAGTTGCA  
 2601 GTTGCGCCCG CGAACGACAT TTATAATGAA CGTGAATTGC TCAACAGTAT  
 2651 GAACATTCG CAGCCTACCG TAGTGTGTTGT TTCCAAAAG GGGTTGCAAA

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2701 AAATTTTGAA CGTGCAAAAA AAATTACCAA TAATCCAGAA AATTATTATC  
 2751 ATGGATTCTA AAACGGATTA CCAGGGATTT CAGTCGATGT ACACGTTCTG  
 2801 CACATCTCAT CTACCTCCCG GTTTTAATGA ATACGATTTT GTACCAGAGT  
 2851 CCTTTGATCG TGACAAAACA ATTGCACTGA TAATGAATTC CTCTGGATCT  
 2901 ACTGGGTTAC CTAAGGGTGT GGCCCTTCCG CATAGAACTG CCTGCGTCAG  
 2951 ATTCTCGCAT GCCAGAGATC CTATTTTTGG CAATCAAATC ATTCCGGATA  
 3001 CTGCGATTTT AAGTGTGTGTT CCATTCCATC ACGGTTTTGG AATGTTTACT  
 3051 ACACTCGGAT ATTTGATATG TGGATTTCTGA GTCGTCTTAA TGTATAGATT  
 3101 TGAAGAAGAG CTGTTTTTAC GATCCCTTCA GGATTACAAA ATTCAAAGTG  
 3151 CGTTGCTAGT ACCAACCCTA TTTTCATTCT TCGCCAAAAG CACTCTGATT  
 3201 GACAAATACG ATTTATCTAA TTTACACGAA ATTGCTTCTG GGGGCGCACC  
 3251 TCTTTCGAAA GAAGTCGGGG AAGCGGTTGC AAAACGCTTC CATCTTCCAG  
 3301 GGATACGACA AGGATATGGG CTCACTGAGA CTACATCAGC TATTCTGATT  
 3351 ACACCCGAGG GGGATGATAA ACCGGGCGCG GTCGGTAAAG TTGTTCCATT  
 3401 TTTTGAAGCG AAGGTTGTGG ATCTGGATAC CGGAAAACG CTGGGCGTTA  
 3451 ATCAGAGAGG CGAATTATGT GTCAGAGGAC CTATGATTAT GTCCGGTTAT  
 3501 GTAAACAATC CGGAAGCGAC CAACGCCTTG ATTGACAAGG ATGGATGGCT  
 3551 ACATTCTGGA GACATAGCTT ACTGGGACGA AGACGAACAC TTCTTCATAG  
 3601 TTGACCGCTT GAAGTCTTTA ATTAAATACA AAGGATATCA GGTGGCCCCC  
 3651 GCTGAATTGG AATCGATATT GTTACAACAC CCCAACATCT TCGACGCGGG  
 3701 CGTGGCAGGT CTTCCCGACG ATGACGCCGG TGAACCTCCC GCCGCCGTTG  
 3751 TTGTTTTGGA GCACGGAAAG ACGATGACGG AAAAAGAGAT CGTGGATTAC  
 3801 GTCGCCAGTC AAGTAACAAC CGCGAAAAAG TTGCGCGGAG GAGTTGTGTT  
 3851 TGTGGACGAA GTACCGAAAG GTCTTACCGG AAAACTCGAC GCAAGAAAAA  
 3901 TCAGAGAGAT CCTCATAAAG GCCAAGAAGG GCGGAAAGTC CAAATTGTAA  
 3951 AATGTAAGT TATTCAGCGA TGACGAAATT CTTAGCTATT GTAATGACTC  
 4001 TAGAGGATCT TTGTGAAGGA ACCTTACTTC TGTGGTGTGA CATAATTGGA  
 4051 CAAACTACCT ACAGAGATTT AAAGCTCTAA GGTAATATA AAATTTTTAA

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4101 GTGTATAATG TGTTAAACTA CTGATTCTAA TTGTTTGTGT ATTTTAGATT  
4151 CCAACCTATG GAACTGATGA ATGGGAGCAG TGGTGGAATG CCTTTAATGA  
4201 GGAAAACCTG TTTTGCTCAG AAGAAATGCC ATCTAGTGAT GATGAGGCTA  
4251 CTGCTGACTC TCAACATTCT ACTCCTCCAA AAAAGAAGAG AAAGGTAGAA  
4301 GACCCCAAGG ACTTTCCTTC AGAATTGCTA AGTTTTTTGA GTCATGCTGT  
4351 GTTTAGTAAT AGAACTCTTG CTTGCTTTGC TATTTACACC ACAAAGGAAA  
4401 AAGCTGCACT GCTATACAAG AAAATTATGG AAAAATATTC TGTAACCTTT  
4451 ATAAGTAGGC ATAACAGTTA TAATCATAAC ATACTGTTTT TTCTTACTCC  
4501 ACACAGGCAT AGAGTGTCTG CTATTAATAA CTATGCTCAA AAATTGTGTA  
4551 CCTTTAGCTT TTTAATTTGT AAAGGGGTTA ATAAGGAATA TTTGATGTAT  
4601 AGTGCCTTGA CTAGAGATCA TAATCAGCCA TACCACATTT GTAGAGGTTT  
4651 TACTTGCTTT AAAAAACCTC CCACACCTCC CCCTGAACCT GAAACATAAA  
4701 ATGAATGCAA TTGTTGTTGT TAACTTGTTT ATTGCAGCTT ATAATGGTTA  
4751 CAAATAAAGC AATAGCATCA CAAATTCAC AAATAAAGCA TTTTTTTCAC  
4801 TGCAATCTAG TTGTGGTTTG TCCAAACTCA TCAATGTATC TTATCATGTC  
4851 TGGATCCCCG GGTCCCTATA GTGAGTCGTA TTAGCTTGGC GTAATCATGG  
4901 TCATAGCTGT TTCCTGTGTG AAATTGTTAT CCGCTCACA TTCCACACAA  
4951 CATACGAGCC GGAAGCATAA AGTGTAAGC CTGGGGTGCC TAATGAGTGA  
5001 GCTAACTCAC ATTAATTGCG TTGCGCTCAC TGCCCGCTTT CCAGTCGGGA  
5051 AACCTGTCGT GCCAGCTGCA TTAATGAATC GGCCAACGCG CGGGGAGAGG  
5101 CGGTTTGCCT ATTGGGCGCT CTTCCGCTTC CTCGCTCACT GACTCGCTGC  
5151 GCTCGGTCGT TCGGCTGCGG CGAGCGGTAT CAGCTCACTC AAAGGCGGTA  
5201 ATACGGTTAT CCACAGAATC AGGGGATAAC GCAGGAAAGA ACATGTGAGC  
5251 AAAAGGCCAG CAAAAGGCCA GGAACCGTAA AAAGGCCGCG TTGCTGGCGT  
5301 TTTTCCATAG GCTCCGCCCC CCTGACGAGC ATCACAATAA TCGACGCTCA  
5351 AGTCAGAGGT GCGGAAACCC GACAGGACTA TAAAGATACC AGGCGTTTCC  
5401 CCCTGGAAGC TCCCTCGTGC GCTCTCCTGT TCCGACCCTG CCGCTTACCG  
5451 GATACCTGTC CGCCTTCTC CCTTCGGGAA GCGTGGCGCT TTCTCAATGC

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5501 TCACGCTGTA GGTATCTCAG TTCGGTGTAG GTCGTTGCT CCAAGCTGGG  
5551 CTGTGTGCAC GAACCCCCCG TTCAGCCCGA CCGCTGCGCC TTATCCGGTA  
5601 ACTATCGTCT TGAGTCCAAC CCGGTAAGAC ACGACTTATC GCCACTGGCA  
5651 GCAGCCACTG GTAACAGGAT TAGCAGAGCG AGGTATGTAG GCGGTGCTAC  
5701 AGAGTTCTTG AAGTGGTGGC CTAACCTACG CTACACTAGA AGGACAGTAT  
5751 TTGGTATCTG CGCTCTGCTG AAGCCAGTTA CCTTCGGAAA AAGAGTTGGT  
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5951 GGGATTTTGG TCATGAGATT ATCAAAAAGG ATCTTCACCT AGATCCTTTT  
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6151 TACGATACGG GAGGGCTTAC CATCTGGCCC CAGTGCTGCA ATGATACCGC  
6201 GAGACCCACG CTCACCGGCT CCAGATTTAT CAGCAATAAA CCAGCCAGCC  
6251 GGAAGGGCCG AGCGCAGAAG TGGTCCTGCA ACTTTATCCG CCTCCATCCA  
6301 GTCTATTAAT TGTGCGGGG AAGCTAGAGT AAGTAGTTCG CCAGTTAATA  
6351 GTTTGCGCAA CGTTGTTGCC ATTGCTACAG GCATCGTGGT GTCACGCTCG  
6401 TCGTTTGGTA TGGCTTCATT CAGCTCCGGT TCCCAACGAT CAAGGCGAGT  
6451 TACATGATCC CCCATGTTGT GCAAAAAAGC GGTTAGCTCC TTCGGTCCTC  
6501 CGATCGTTGT CAGAAGTAAG TTGGCCGCGAG TGTTATCACT CATGGTTATG  
6551 GCAGCACTGC ATAATTCTCT TACTGTCATG CCATCCGTAA GATGCTTTTC  
6601 TGTGACTGGT GAGTACTCAA CCAAGTCATT CTGAGAATAG TGTATGCGGC  
6651 GACCGAGTTG CTCTTGCCCC GCGTCAATAC GGGATAATAC CGCGCCACAT  
6701 AGCAGAACTT TAAAAGTGCT CATCATTGGA AAACGTTCTT CGGGGCGAAA  
6751 ACTCTCAAGG ATCTTACCGC TGTTGAGATC CAGTTCGATG TAACCCACTC  
6801 GTGCACCCAA CTGATCTTCA GCATCTTTTA CTTTCACCAG CGTTTCTGGG  
6851 TGAGCAAAAA CAGGAAGGCA AAATGCCGCA AAAAAGGGAA TAAGGGCGAC

- 25756 -

6901 ACGGAAATGT TGAATACTCA TACTCTTCCT TTTTCAATAT TATTGAAGCA  
6951 TTTATCAGGG TTATTGTCTC ATGAGCGGAT ACATATTGA ATGTATTTAG  
7001 AAAAATAAAC AAATAGGGGT TCCGCGCACA TTTCCCCGAA AAGTGCCACC  
7051 TGACGTCTAA GAAACCATTA TTATCATGAC ATTAACCTAT AAAAATAGGC  
7101 GSTATCACGAG GCCCTTTCGT CTCGCGCGTT TCGGTGATGA CGGTGAAAAC  
7151 CTCTGACACA TGCAGCTCCC GGAGACGGTC ACAGCTTGTC TGTAAGCGGA  
7201 TGCCGGGAGC AGACAAGCCC GTCAGGGCGC GTCAGCGGGT GTTGGCGGGT  
7251 GTCGGGGCTG GCTTAACTAT GCGGCATCAG AGCAGATTGT ACTGAGAGTG  
7301 CACCATATGC GGTGTGAAAT ACCGCACAGA TCGTAAGGA GAAAATACCG  
7351 CATCAGGCGC CATTCGCCAT TCAGGCTGCG CAACTGTTGG GAAGGGCGAT  
7401 CGGTGCGGGC CTCTTCGCTA TTACGCCAGC TGGCGAAAGG GGGATGTGCT  
7451 GCAAGGCGAT TAAGTTGGGT AACGCCAGGG TTTTCCCAGT CACGACGTTG  
7501 TAAAACGACG GCCAGTGAAT TTCGACCTGC AGTCGACAGA AGCCTTACGT  
7551 GACAGCTGGC GAAGAACCAT GGCCAGCTGG TGACAAGCCA AAACAGCTCT  
7601 GGCTCGCAA ACATGTTCCC TTGGCTGCTT TCCACTTCCC CTTGTGCTTT  
7651 GTTTACTTGT GTCAGCTGGT TGGCTCCCTA GGTATGAGCT CATGCTTGGC  
7701 TGGCAGCCAT CCAGTTTTAG CCAGCTCTGC TTTGTTTACT TGTGTCAGCT  
7751 GGTGGGCTCC CTAGGTATGA GTCATGCTT GGCTGGCAGC CATCCAGTTT  
7801 TAGCCAGCTC CTCCCTACCT TCCCTTTTTT TTATATATAC AGGAGGCCGA  
7851 GGCCGCCTCC GCCTCCAAGC TTAATCAGAA GTAGTAAGGG CGTGGAGGCT  
7901 TTTTAGGAGG CCAGGGAAAT TCCCTTGTTT TTCCCTTTTT TGCAGTAATT  
7951 TTTTGCTGCA AAAAGCTAA

Fig. 18

- 26/56 -

JCVPlong-gdnf Length: 6971 June 8, 1999 16:42 Type: N Check: 3588

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1  GCTAGCGATT TAGGTGACAC TATAGAATAG ATCCCCATGA AGTTATGGGA
51  TGTCGTGGCT GTCTGCCTGG TGCTGCTCCA CACCGCGTCC GCCTTCCCQC
101 TGCCCCGCCG TAAGAGGCCT CCCGAGGCGC CCGCCGAAGA CCGCTCCCTC
151 GGCCGCCGCC GCGCGCCCTT CGCGCTGAGC AGTGAAGCAA ATATGCCAGA
201 GGATTATCCT GATCAGTTCG ATGATGTCAT GGATTTTATT CAAGCCACCA
251 TTAAGAGACT GAAAAGGTCA CCAGATAAAC AAATGGCAGT GCTTCCTAGA
301 AGAGAGCGGA ATCGGCAGGC TGCAGCTGCC AACCCAGAGA ATCCAGAGG
351 AAAAGGTGCG AGAGGCCAGA GGGGCAAAAA CCGGGGTGTG GTCTTAACTG
401 CAATACATTT AAATGTCACT GACTTGGGTC TGGGCTATGA AACCAAGGAG
451 GAACTGATTT TTAGGTACTG CAGCGGCTCT TGCAGTGCAG CTGAGACAAC
501 GTACGACAAA ATATTGAAAA ACTTATCCAG AAATAGAAGG CTGGTGAGTG
551 ACAAAGTAGG GCAGGCATGT TGCAGACCCA TCGCCTTTGA TGATGACCTG
601 TCGTTTTTTAG ATGATAACCT GGTTTACCAT ATTCTAAGAA AGCATTCCGC
651 TAAAAGGTGT GGATGTATCT GACTGGTGGC CCGTCTTCC CGACGTTAAA
701 GGGATGAAAC CACAAGACTT ACCTTCGCTC GGAAGTAAAA CGACAAACAC
751 ACACAGTTTT GCCCGTTTTT ATGAGAAATG GGACGTCTGC GCACGAAACG
801 CGCCGTCGCT TGAGGAGGAC TTGTACAAAC ACGATCTATG CAGGTTTCCC
851 CAACTGACAC AAACCGTGCA ACTTGAAACT CCGCCTGGTC TTTCCAGGTC
901 TAGAGGGGTA ACATTTTGTA CTGTGTTTGA CTCCACGCTC GATCCACTAG
951 CGAGTGTTAG TAGCGGTACT GCTGTCTCGT AGCGGAGCAT GTTGCCCGTG
1001 GGAACACCTC CTTGGTAACA AGGACCCACG GGGCCGAAAG CCATGTCCTA
1051 ACGGACCCAA CATGTGTGCA ACCCCAGCAC GGCAGCTTTA CTGTGAAACC
1101 CACTTCAAGG TGACATTGAT ACTGGTACTC AAACACTGGT GACAGGCTAA
1151 GGATGCCCTT CAGGTACCCC GAGGTAACAA GCGACACTCG GGATCTGAGA
1201 AGGGGACTGG GACTTCTTTA AAGTGCCAG TTTAAAAAGC TTCTACGCCT
1251 GAATAGGTGA CCGGAGGCCG GCACCTTTCC TTTTATAACC ACTGAACACA
1301 TGGAAGACGC CAAAACATA AAGAAAGGCC CCGCGCCATT CTATCCTCTA
1351 GAGGATGGAA CCGCTGGAGA GCAACTGCAT AAGGCTATGA AGAGATACGC
1401 CCTGGTTTCT GGAACAATTG CTTTACAGA TGCACATATC GAGGTGAACA
1451 TCACGTACGC GGAATACTTC GAAATGTCCG TTCGGTTGGC AGAAGCTATG
1501 AAACGATATG GGCTGAATAC AAATCACAGA ATCGTCGTAT GCAGTAAAAA
1551 CTCTCTCAA TTCTTTATGC CCGTGTGGG CCGGTTATTT ATCGGAGTTG
1601 CAGTTGCGCC CGCGAACGAC ATTTATAATG AACGTGAATT GCTCAACAGT
1651 ATGAACATTT CGCAGCCTAC CGTAGTGTTC GTTCCAAAAA AGGGGTTGCA
1701 AAAAAATTTG AACGTGCAAA AAAAATTACC AATAATCCAG AAAATTATTA
1751 TCATGGATTC TAAAACGGAT TACCAGGGAT TTCAGTCGAT GTACACGTTT
1801 GTCACATCTC ATCTACCTCC CGGTTTTAAT GAATACGATT TTGTACCAGA
1851 GTCCTTTGAT CGTGACAAAA CAATTGCACT GATAATGAAT TCCTCTGGAT
1901 CTAATGGGTT ACCTAAGGGT GTGGCCCTTC CGCATAGAAC TGCCTGCGTC
1951 AGATTCTCGC ATGCCAGAGA TCCTATTTTT GGCAATCAAA TCATTCCGGA
2001 TACTGCGATT TTAAGTGTG TTCCATTCCA TCACGGTTTT GGAATGTTTA
2051 CTACACTCGG ATATTTGATA TGTGGATTTC GAGTCGTCTT AATGTATAGA
2101 TTTGAAGAAG AGCTGTTTTT ACGATCCCTT CAGGATTACA AAATTCAAAG
2151 TGCGTTGCTA GTACCAACCC TATTTTCATT CTTCGCCAAA AGCACTCTGA
2201 TTGACAAATA CGATTTATCT AATTTACACG AAATTGCTTC TGGGGGCGCA
2251 CCTCTTTCGA AAGAAGTCGG GGAAGCGGTT GCAAAACGCT TCCATCTTCC
2301 AGGGATACGA CAAGGATATG GGCTCACTGA GACTACATCA GCTATTCTGA
2351 TTACACCCGA GGGGGATGAT AAACCGGGCG CGGTCGGTAA AGTTGTTCCA
2401 TTTTTTGAAG CGAAGGTTGT GGATCTGGAT ACCGGGAAAA CGCTGGGCGT
2451 TAATCAGAGA GGCGAATTAT GTGTCAGAGG ACCTATGATT ATGTCCGGTT
2501 ATGTAAACAA TCCGGAAGCG ACCAACGCCT TGATTGACAA GGATGGATGG
2551 CTACATTCTG GAGACATAGC TTACTGGGAC GAAGACGAAC ACTTCTTCAT
2601 AGTTGACCGC TTGAAGTCTT TAATTAAATA CAAAGGATAT CAGGTGGCCC
2651 CCGCTGAATT GGAATCGATA TTGTTACAAC ACCCAACAT CTTCGACGCG
2701 GCGGTGGCAG GTCTTCCCGA CGATGACGCC GGTGAACCTC CCGCCGCCGT
2751 TGTGTTTTTG GAGCACGGAA AGACGATGAC GGAAGAAAGAG ATCGTGGATT
2801 ACGTCGCCAG TCAAGTAACA ACCGCGAAAA AGTTGCGCGG AGGAGTTGTG
2851 TTTGTGGACG AAGTACCGAA AGGTCTTACC GGAAGAACTC ACCTAAGAAA
2901 AATCAGAGAG ATCCTCATAA AGGCCAAGAA GGGCGGAAAG TCCAAATTGT
2951 AAAATGTAAC TGTATTACGC GATGACGAAA TTCTTAGCTA TTGTAATGAC
3001 TCTAGAGGAT CTTGTGAAG GAACCTTACT TCTGTGGTGT GACATAATTG
3051 GACAACTAC CTACAGAGAT TTAAGCTCTT AAGGTAAATA TAAAAATTTT
3101 AAGTGTATAA TGTGTTAAAC TACTGATTCT AATTGTTTGT GTATTTTAGA
3151 TTCCAACCTA TGGAAGTATG GAATGGGAGC AGTGGTGGAA TGCCTTTAAT
3201 GAGGAAAACC TGTTTTGCTC AGAAGAAATG CCATCTAGTG ATGATGAGGC

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Fig. 19

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3251 TACTGCTGAC TCTCAACATT CTACTCCTCC AAAAAAGAAG AGAAAGGTAG  
 3301 AAGACCCCAA GGACTTTTCT TCAGAATTGC TAAGTTTTTT GAGTCATGCT  
 3351 GTGTTTAGTA ATAGAACTCT TGCTTGCTTT GCTATTTTACA CCACAAAGGA  
 3401 AAAAGCTGCA CTGCTATACA AGAAAATTAT GGAAAAATAT TCTGTAACCT  
 3451 TTATAAGTAG GCATAACAGT TATAATCATA ACATACTGTT TTTTCTTACT  
 3501 CCACACAGGC ATAGAGTGTC TGCTATTAAT AACTATGCTC AAAAAATTGTG  
 3551 TACCTTTAGG TTTTAAATTT GTAAAGGGT TAATAAGGAA TATTTGATGT  
 3601 ATAGTGCCTT GACTAGAGAT CATAATCAGC CATACCACAT TTGTAGAGGT  
 3651 TTTACTTGCT TTA AAAAACC TCCCACACCT CCCCCTGAAC CTGAAACATA  
 3701 AAATGAATGC AATTGTGTG GTTAACTTGT TTATTGCAGC TTATAATGCT  
 3751 TACAAATAAA GCAATAGCAT CACAAATTTT ACAAATAAAG CATTTTTTTTTC  
 3801 ACTGCATTCT AGTTGTGGTT TGTCCAACT CATCAATGTA TCTTATCATG  
 3851 TCTGGATCCC CGGGTCCCTA TAGTGAGTCG TATTAGCTTG GCGTAATCAT  
 3901 GGTCATAGCT GTTTCCTGTG TGAAATTGTT ATCCGCTCAC AATTCACAC  
 3951 AACATACGAG CCGGAAGCAT AAAGTGTAAG GCCTGGGGTG CCTAATGAGT  
 4001 GAGCTAACTC ACATTAATTG CGTTGCGCTC ACTGCCCCGT TTCCAGTCGG  
 4051 GAAACCTGTC GTGCCAGCTG CATTAAATGAA TCGGCCAACG CGCGGGGAGA  
 4101 GGCGGTTTGC GTATTGGGCG CTCTTCCGCT TCCTCGCTCA CTGACTCGCT  
 4151 GCGCTCGGTC GTTCGGCTGC GCGGAGCGGT ATCAGCTCAC TCAAAGGCGG  
 4201 TAATACGGTT ATCCACAGAA TCAGGGGATA ACGCAGGAAA GAACATGTGA  
 4251 GCAAAAGGCC AGCAAAAGGC CAGGAACCGT AAAAAAGGCC CGTTGCTGGC  
 4301 GTTTTTCCAT AGGCTCCGCC CCCCTGACGA GCATCACAAA AATCGACGCT  
 4351 CAAGTCAGAG GTGGCGAAAC CCGACAGGAC TATAAAGATA CCAGGCGTTT  
 4401 CCCCCTGGAA GCTCCCTCGT GCGCTCTCCT GTTCCGACCC TGCCGCTTAC  
 4451 CGGATACCTG TCCGCTTTC TCCCTTCGGG AAGCGTGGCG CTTTCTCAAT  
 4501 GCTCACGCTG TAGGTATCTC AGTTCGGTGT AGGTGCTTCG CTCCAAGCTG  
 4551 GGCTGTGTGC ACGAACCCCC CGTTCAGCCC GACCGCTGCG CCTTATCCGG  
 4601 TAACTATCGT CTTGAGTCCA ACCCGTAAG ACACGACTTA TCGCCACTGG  
 4651 CAGCAGCCAC TGGTAACAGG ATTAGCAGAG CGCTAACTAC GGCTACACTA GAAGGACAGT  
 4701 ACAGAGTTCT TGAAGTGGTG GCCTAACTAC GGCTACACTA GAAGGACAGT  
 4751 ATTTGGTATC TGCGCTCTGC TGAAGCCAGT TACCTTCGGA AAAAGAGTTG  
 4801 GTAGCTCTTG ATCCGGCAAA CAAACCACCG CTGGTAGCGG TGGTTTTTTT  
 4851 GTTTGCAAGC AGCAGATTAC GCGCAGAAAA AAAGGATCTC AAGAAGATCC  
 4901 TTTGATCTTT TCTACGGGGT CTGACGCTCA GTGGAACGAA AACTCACGTT  
 4951 AAGGGATTTT GGTCAAGAGA TTATCAAAAA GGATCTTCAC CTAGATCCTT  
 5001 TTAATTAATA AATGAAGTTT TAAATCAATC TAAAGTATAT ATGAGTAAAC  
 5051 TTGGTCTGAC AGTTACCAAT GCTTAATCAG TGAGGCACCT ATCTCAGCGA  
 5101 TCTGTCTATT TCGTTCATCC ATAGTTGCCT GACTCCCCGT CGTGTAGATA  
 5151 ACTACGATAC GGGAGGGCTT ACCATCTGGC CCCAGTGCTG CAATGATACC  
 5201 GCGAGACCCA CGCTCACC GGCTCCAGATT ATCAGCAATA AACCAGCCAG  
 5251 CCGGAAGGGC CGAGCGCAGA AGTGGTCTTG CAACTTTATC CGCTCCATC  
 5301 CAGTCTATTA ATTGTTGCGG GGAAGCTAGA GTAAGTAGTT CGCCAGTTAA  
 5351 TAGTTTGGCG AACGTTTGG CCATTGCTAC AGGCATCGTG GTGTCACGCT  
 5401 CGTCGTTTGG TATGGCTTCA TTCAGCTCCG GTTCCCAACG ATCAAGGCGA  
 5451 GTTACATGAT CCCCCATGTT GTGCAAAAAA GCGGTTAGCT CCTTCGTTCC  
 5501 TCCGATCGTT GTCAGAAGTA AGTTGGCCGC AGTGTATCA CTCATGGTTA  
 5551 TGGCAGCACT GCATAATTCT CTTACTGTCA TGCCATCCGT AAGATGCTTT  
 5601 TCTGTGACTG GTGAGTACTC AACCAGTCA TTCTGAGAAT AGTGTATGCG  
 5651 GCGACCGAGT TGCTCTTGCC CGGCGTCAAT ACGGGATAAT ACCGCGCCAC  
 5701 ATAGCAGAAC TTTAAAAGTG CTCATCATTT TACTTTCACC AGCGTTTCTG  
 5751 AAACCTCTCA GGATCTTACC GCTGTTGAGA TCCAGTTCGA TGTAACCCAC  
 5801 TCGTGACCCC AACTGATCTT CAGCATCTTT TACTTTCACC AGCGTTTCTG  
 5851 GGTGAGCAAA AACAGGAAGG CAAAATGCCG CAAAAAGGG AATAAGGGCG  
 5901 ACACGGAAAT GTTGAATACT CATACTCTTC CTTTTTCAAT ATTATTGAAG  
 5951 CATTTATCAG GGTATTGTG TCATGAGCGG ATACATATTT GAATGATTTT  
 6001 AGAAAAATAA ACAAATAGGG GTTCCGCGCA CATTTCCTCG AAAAGTGCCA  
 6051 CCTGACGCTT AAGAAACCAT TATTATCATG ACATTAACCT ATAAAAATAG  
 6101 GCGTATCAG AGGCCCTTTC GTCTCGCGCG TTTCGGTGAT GACGGTGAAA  
 6151 ACCTCTGACA CATGCAGCTC CCGGAGACGG TCACAGCTTG TCTGTAAGCG  
 6201 GATGCCGGGA GCAGACAAGC CCGTCAGGGC GCGTCAGCGG GTGTTGGCGG  
 6251 GTGTGCGGGC TGGCTTAACT ATGCGGCATC AGAGCAGATT GTACTGAGAG  
 6301 TGCAACATAT GCGGTGTGAA ATACCGCACA GATGCGTAAG GAGAAAATAC  
 6351 CGCATCAGGC GCCATTGCGC ATTCAGGCTG CGCAACTGTT GGGGAGGGCG  
 6401 ATCGGTGCGG GCCTCTTCGC TATTACGCCA GCTGGCGAAA GGGGATGTG  
 6451 CTGCAAGGCG ATTAAGTTGG GTAACGCCAG GGTTCCTCCA GTCACGACGT  
 6501 TGTAAACGA CGCCAGTGA ATTTGACCT GCAGTCGACA GAAGCCTTAC  
 6551 GTGACAGCTG GCGAAGAACC ATGGCCAGCT GGTGACAAGC CAAAACAGCT

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6601 CTGGCTCGCA AAACATGTTT CTTGGCTGC TTTCCACTTC CCCTTGTGCT  
6651 TTGTTTACTT GTGTCAGCTG GTTGGCTCCC TAGGTATGAG CTCATGCTTG  
6701 GCTGGCAGCC ATCCAGTTTT AGCCAGCTCT GCTTTGTTTA CTTGTGTCAG  
6751 CTGGTTGGCT CCCTAGGTAT GAGCTCATGC TTGGCTGGCA GCCATCCAGT  
6801 TTTAGCCAGC TCCTCCCTAC CTCCCTTTT TTTTATATAT ACAGGAGGCC  
6851 GAGGCCGCCT CCGCCTCCAA GCTTACTCAG AAGTAGTAAG GGCCTGGAGG  
6901 CTTTTTAGGA GGCCAGGGAA ATCCCTTGT TTTCCCTTT TTTGCAGTAA  
6951 TTTTTTGCTG CAAAAGCTA A

Fig. 19



pD12JCVpshort-hCNTF

Length: 7558

1 GCTAGCGATT TAGGTGACAC TATAGAATCt cgacnnGTCA CCCCTAGAGT  
 51 CGAGCTGTGA CGGTCCTTAC AATGAAATGC ANCTGGGGTTA TCTTCTTCCT  
 101 GATGGCAGGG GTTACAGGTA AGGGGCTCCC AAGTCCCAAA CTTGAGGGTC  
 151 CATAAACTCT GTGACAGTGG CAATCACTTT GCCTTTCTTT CTACAGGGGT  
 201 GAATTCGGCT TTCACAGAGC ATTCACCGCT GACCCCTCAC CGTCGGGACC  
 251 TCTGTAGCCG CTCTATCTGG CTAGCAAGGA AGATTCGTTT AGACCTTGAC  
 301 TGCTCTTACG GAATCCTATG TAAGTTGCCT ATTTTGCTGT TATCTGTTTT  
 351 CCCTTCATCT TTTTGTATCC AGCAACTTAC CATCACGCAT CAGCTCCATT  
 401 ACCAATTGTG AAAGCTCTAA TCATATAGTC ATTCATATAG GTTATTGAC  
 451 ATGGGCCCTT CCCTTGAGGA AACCCTATGT ACTTTATTTT CTTCTCTGG  
 501 GCTGTTTAGG AGATGAAGTT ACTTGAATGA GAAAATATAT ATGGAGTTCT  
 551 AGAAAGGATT GGTTTATATG TCTTGAGGC TATTTCAAAA TTTATTGGC  
 601 CATATATTCT GAATACTACC TAGAACAGAT TAGCCATGGG CCCTNTGGGT  
 651 TNTTCATAAG CCATTGTTCT GAANTTTTTT AGCTTTGTAA ATGAAAGGTT  
 701 TATGGGATAG GAAGAGTNCT ATGAACGTGG GAGGAATTTG TAAATCCTAC  
 751 CAATTNTNC TATATAGCAT TAGCCCCAC CTTTANTAT TCTGCATCAA  
 801 AAGTAAGATT GTGTCTAAAG AGAAAGGTNA GCTATCAAAA GGACTCCTAT  
 851 AANATTCNTT GGAACTTNT GGAANTGTCA AATTNTTTG AGCTAATNT  
 901 TGGAGTTCCA AANTTGTCT TTNACAGTN AAGGGGGANC CCCATTCANA  
 951 TTNCCCCC TNNNGANAAT GCTTGGGGGA AAAAACCTNC CAACCCNTT  
 1001 GTGGGANGAA GTTTTTTAA NNTTTTAAGG CTNGNNGAAA CNGGNTTTA  
 1051 ATTTTTTGGG NCNANCGCCT NTCCCCGGTA CCAGGAAAT CAGGACCTNT  
 1101 TTTTGGGGNN GNGCNCNAC NGGGGGGNA AANGGAAAT TTCNTCANAA  
 1151 AAAATCTTTT CCGnnnnnnng tgaagcatca gggcctgaac aagaacatca  
 1201 acctggactc tgcggatggg atgccagtgg caagcactga tcagtggagt  
 1251 gagctgaccg aggcagagcg actccaagag aaccttcaag cttatcgta

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1301 cttccatggt ttgttgcca ggctcttaga agaccagcag gtgcatttta  
 1351 ccccaaccga aggtgacttc catcaagcta tacataccct tcttctccaa  
 1401 gtcgctgcct ttgcatacca gatagaggag ttaatgatac tcctggaata  
 1451 caagatcccc cgcaatgagg ctgatgggat gcctattaat gttggagatg  
 1501 gtggtctctt tgagaagaag ctgtggggcc taaagggtgct gcaggagctt  
 1551 tcacagtgga cagtaaggtc catccatgac ctteggtttca tttcttctca  
 1601 tcagactggg atcccagcac gtgggagcca ttatattgct aacaacaaga  
 1651 aaatgtagnn nnnngcgccT GCGCCGTCTT TCCCGACGTT AAAGGGATGA  
 1701 AACCACAAGA CTTACCTTCG CTCGGAAGTA AAACGACAAA CACACACAGT  
 1751 TTTGCCCGTT TTCATGAGAA ATGGGACGTC TGCGCACGAA ACGCGCCGTC  
 1801 GCTTGAGGAG GACTTGATCA AACACGATCT ATGCAGGTTT CCCCAACTGA  
 1851 CACAAACCGT GCAACTTGAA ACTCCGCCTG GTCTTTCCAG GTCTAGAGGG  
 1901 GTAACATTTT GTACTGTGTT TGAATCCACG CTCGATCCAC TAGCGAGTGT  
 1951 TAGTAGCGGT ACTGCTGTCT CGTAGCGGAG CATGTTGGCC GTGGGAACAC  
 2001 CTCCTTGGTA ACAAGGACCC ACGGGGCCGA AAGCCATGTC CTAACGGACC  
 2051 CAACATGTGT GCAACCCAG CACGGCAGCT TTAATGTGAA ACCCACTTCA  
 2101 AGGTGACATT GATACTGGTA CTCAAACACT GGTGACAGGC TAAGGATGCC  
 2151 CTTAGGTAC CCGAGGTAA CAAGCGACAC TCGGGATCTG AGAAGGGGAC  
 2201 TGGGACTTCT TTAAAGTGCC CAGTTTAAAA AGCTTCTACG CCTGAATAGG  
 2251 TGACCGGAGG CCGGCACCTT TCCTTTTATA ACCACTGAAC ACATGGAAGA  
 2301 CGCCAAAAAC ATAAAGAAAG GCCCGGCGCC ATTCTATCCT CTAGAGGATG  
 2351 GAACCGCTGG AGAGCAACTG CATAAGGCTA TGAAGAGATA CGCCCTGGTT  
 2401 CCTGGAACAA TTGCTTTTAC AGATGCACAT ATCGAGGTGA ACATCACGTA  
 2451 CGCGGAATAC TTCGAAATGT CCGTTCGGTT GGCAGAAGCT ATGAAACGAT  
 2501 ATGGGCTGAA TACAAATCAC AGAATCGTCG TATGCAGTGA AAATCTCTT  
 2551 CAATTCTTTA TGCCGGTGTT GGGCGCGTTA TTTATCGGAG TTGCAGTTGC  
 2601 GCCCGCGAAC GACATTTATA ATGAACGTGA ATTGCTCAAC AGTATGAACA  
 2651 TTTGCGAGCC TACCGTAGTG TTTGTTTCCA AAAAGGGGTT GCAAAAAATT

Fig. 20

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2701 TTGAACGTGC AAAAAAATT ACCAATAATC CAGAAAATTA TTATCATGGA  
2751 TTCTAAAACG GATTACCAGG GATTTCAGTC GATGTACACG TTCGTCACAT  
2801 CTCATCTACC TCCCGGTTTT AATGAATACG ATTTTGTACC AGAGTCCTTT  
2851 GATCGTGACA AAACAATTGC ACTGATAATG AATTCCTCTG GATCTACTGG  
2901 GTTACCTAAG GGTGTGGCCC TTCCGCATAG AACTGCCTGC GTCAGATTCT  
2951 CGCATGCCAG AGATCCTATT TTTGGCAATC AAATCATTCC GGATACTGCG  
3001 ATTTTAAGTG TTGTTCCATT CCATCACGGT TTTGGAATGT TTACTACACT  
3051 CGGATATTTG ATATGTGGAT TTCGAGTCGT CTTAATGTAT AGATTTGAAG  
3101 AAGAGCTGTT TTTACGATCC CTTCAGGATT ACAAATTC AAGTGCGTTG  
3151 CTAGTACCAA CCCTATTTTC ATTCTTCGCC AAAAGCACTC TGATTGACAA  
3201 ATACGATTTA TCTAATTTAC ACGAAATTGC TTCTGGGGGC GCACCTCTTT  
3251 CGAAAGAAGT CGGGGAAGCG GTTGCAAAAC GCTTCCATCT TCCAGGGATA  
3301 CGACAAGGAT ATGGGCTCAC TGAGACTACA TCAGCTATTC TGATTACACC  
3351 CGAGGGGGAT GATAAACCGG GCGCGGTCGG TAAAGTTGTT CCATTTTTTG  
3401 AAGCGAAGGT TGTGGATCTG GATACCGGGA AAACGCTGGG CGTTAATCAG  
3451 AGAGGCGAAT TATGTGTCAG AGGACCTATG ATTATGTCCG GTTATGTAAA  
3501 CAATCCGGAA GCGACCAACG CTTTGATTGA CAAGGATGGA TGGCTACATT  
3551 CTGGAGACAT AGCTTACTGG GACGAAGACG AACACTTCTT CATAGTTGAC  
3601 CGCTTGAAGT CTTTAATTAA ATACAAAGGA TATCAGGTGG CCCCCGCTGA  
3651 ATTGGAATCG ATATTGTTAC AACACCCCAA CATCTTCGAC GCGGGCGTGG  
3701 CAGGTCTTCC CGACGATGAC GCCGGTGAAC TTCCCGCCGC CGTTGTTGTT  
3751 TTGGAGCACG GAAAGACGAT GACGGAAAAA GAGATCGTGG ATTACGTCCG  
3801 CAGTCAAGTA ACAACCGCGA AAAAGTTGCG CGGAGGAGTT GTGTTTGTGG  
3851 ACGAAGTACC GAAAGGTCTT ACCGGAAAAAC TCGACGCAAG AAAAATCAGA  
3901 GAGATCCTCA TAAAGGCCAA GAAGGGCGGA AAGTCCAAAT TGTAATATGT  
3951 AACTGTATTC AGCGATGACG AAATTCCTAG CTATTGTAAT GACTCTAGAG  
4001 GATCTTTGTG AAGGAACTT ACTTCTGTGG TGTGACATAA TTGGACAAAC  
4051 TACCTACAGA GATTTAAAGC TCTAAGGTAA ATATAAAATT TTTAAGTGTA

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4101 TAATGTGTTA AACTACTGAT TCTAATTGTT TGTGTATTTT AGATTCCAAC  
4151 CTATGGAAC TATGAATGGG AGCAGTGGTG GAATGCCTTT AATGAGGAAA  
4201 ACCTGTTTTG CTCAGAAGAA ATGCCATCTA GTGATGATGA GGCTACTGCT  
4251 GACTCTCAAC ATTCTACTCC TCCAAAAAAG AAGAGAAAGG TAGAAGACCC  
4301 CAAGGACTTT CCTTCAGAAT TGCTAAGTTT TTTGAGTCAT GCTGTGTTTA  
4351 GTAATAGAAC TCTTGCTTGC TTTGCTATTT ACACCACAAA GGAAAAAGCT  
4401 GCACTGCTAT ACAAGAAAAT TATGGAAAAA TATTCTGTAA CCTTTATAAG  
4451 TAGGCATAAC AGTTATAATC ATAACATACT GTTTTTTCTT ACTCCACACA  
4501 GGCATAGAGT GTCTGCTATT AATAACTATG CTCAAAAATT GTGTACCTTT  
4551 AGCTTTTTTAA TTTGTAAAGG GGTTAATAAG GAATATTTGA TGTATAGTGC  
4601 CTTGACTAGA GATCATAATC AGCCATACCA CATTGTAGA GGTTTTACTT  
4651 GCTTTAAAAA ACCTCCCACA CCTCCCCCTG AACCTGAAAC ATAAAATGAA  
4701 TGCAATTGTT GTTGTTAACT TGTTTATTGC AGCTTATAAT GGTTACAAAT  
4751 AAAGCAATAG CATCACAAT TTCACAAATA AAGCATTITT TTCACTGCAT  
4801 TCTAGTTGTG GTTGTCCAA ACTCATCAAT GTATCTTATC ATGTCTGGAT  
4851 CCCCGGGTCC CTATAGTGAG TCGTATTAGC TTGGCGTAAT CATGGTCATA  
4901 GCTGTTTCCT GTGTGAAATT GTTATCCGCT CACAATTCCA CACAACATAC  
4951 GAGCCGGAAG CATAAAGTGT AAAGCCTGGG GTGCCAATG AGTGAGCTAA  
5001 CTCACATTAA TTGCGTTGCG CTCACTGCCC GCTTTCCAGT CGGGAAACCT  
5051 GTCGTGCCAG CTGCATTAAT GAATCGGCCA ACGCGCGGGG AGAGGCGGTT  
5101 TCGTATTGG GCGCTCTTCC GCTTCCTCGC TCACTGACTC GCTGCGCTCG  
5151 GTCGTTCGGC TGCGGCGAGC GGTATCAGCT CACTCAAAGG CGGTAATACG  
5201 GTTATCCACA GAATCAGGGG ATAACGCAGG AAAGAACATG TGAGCAAAAG  
5251 GCCAGCAAAA GGCCAGGAAC CGTAAAAAGG CCGCGTTGCT GGCGTTTTTC  
5301 CATAGGCTCC GCCCCCTGA CGAGCATCAC AAAAATCGAC GCTCAAGTCA  
5351 GAGGTGGCGA AACCCGACAG GACTATAAAG ATACCAGGCG TTTCCCCCTG  
5401 GAAGCTCCCT CGTGCGCTCT CCGTTCCGA CCCTGCCGCT TACCGGATAC  
5451 CTGTCCGCCT TTCTCCCTTC GGAAGCGTG GCGCTTTCTC AATGCTCACG

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5501 CTGTAGGTAT CTCAGTTCGG TGTAGGTCGT TCGCTCCAAG CTGGGCTGTG  
5551 TGCACGAACC CCCCGTTCAG CCCGACCGCT GCGCCTTATC CGGTAACAT  
5601 CGTCTTGAGT CCAACCCGGT AAGACACGAC TTATCGCCAC TGGCAGCAGC  
5651 CACTGGTAAC AGGATTAGCA GAGCGAGGTA TGTAGGCGGT GCTACAGAGT  
5701 TCTTGAAGTG GTGGCCTAAC TACGGCTACA CTAGAAGGAC AGTATTTGGT  
5751 ATCTGCGCTC TGCTGAAGCC AGTTACCTTC GGAAAAAGAG TTGGTAGCTC  
5801 TTGATCCGGC AAACAAACCA CCGCTGGTAG CGGTGGTTTT TTTGTTTGCA  
5851 AGCAGCAGAT TACGCGCAGA AAAAAAGGAT CTCAAGAAGA TCCTTTGATC  
5901 TTTTCTACGG GGTCTGACGC TCAGTGGAAC GAAAACTCAC GTTAAGGGAT  
5951 TTTGGTCATG AGATTATCAA AAAGGATCTT CACCTAGATC CTTTTAAATT  
6001 AAAAATGAAG TTTTAAATCA ATCTAAAGTA TATATGAGTA AACTTGGTCT  
6051 GACAGTTACC AATGCTTAAT CAGTGAGGCA CCTATCTCAG CGATCTGTCT  
6101 ATTTTCGTTCA TCCATAGTTG CCTGACTCCC CGTCGTGTAG ATAACCTACGA  
6151 TACGGGAGGG CTTACCATCT GGCCCCAGTG CTGCAATGAT ACCGCGAGAC  
6201 CCACGCTCAC CGGCTCCAGA TTTATCAGCA ATAAACCAGC CAGCCGGAAG  
6251 GGCCGAGCGC AGAAGTGGTC CTGCAACTTT ATCCGCCTCC ATCCAGTCTA  
6301 TTAATTGTTG CCGGGAAGCT AGAGTAAAGTA GTTCGCCAGT TAATAGTTTG  
6351 CGCAACGTTG TTGCCATTGC TACAGGCATC GTGGTGTCAC GCTCGTCGTT  
6401 TGGTATGGCT TCATTAGCT CCGGTTCCCA ACGATCAAGG CGAGTTACAT  
6451 GATCCCCCAT GTTGTGCAAA AAAGCGGTTA GCTCCTTCGG TCCTCCGATC  
6501 GTTGTGAGAA GTAAGTTGGC CGCAGTGTTA TCACTCATGG TTATGGCAGC  
6551 ACTGCATAAT TCTCTTACTG TCATGCCATC CGTAAGATGC TTTTCTGTGA  
6601 CTGGTGAGTA CTCAACCAAG TCATTCTGAG AATAGTGTAT GCGGCGACCG  
6651 AGTTGCTCTT GCCCGGCGTC AATACGGGAT AATACGCGC CACATAGCAG  
6701 AACTTTAAAA GTGCTCATCA TTGGAAAACG TTCTTCGGGG CGAAAACTCT  
6751 CAAGGATCTT ACCGCTGTTG AGATCCAGTT CGATGTAACC CACTCGTGCA  
6801 CCCAACTGAT CTTAGCATC TTTTACTTTC ACCAGCGTTT CTGGGTGAGC  
6851 AAAAACAGGA AGGCAAAATG CCGCAAAAAA GGAATAAGG GCGACACGGA

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6901 AATGTTGAAT ACTCATACTC TTCCTTTTTC AATATTATTG AAGCATTTAT  
6951 CAGGGTTATT GTCTCATGAG CGGATACATA TTTGAATGTA TTTAGAAAAA  
7001 TAAACAAATA GGGGTTCCGC GCACATTTCC CCGAAAAGTG CCACCTGACG  
7051 TCTAAGAAAC CATTATTATC ATGACATTAA CCTATAAAAA TAGGCGTATC  
7101 ACGAGGCCCT TTCGTCTCGC GCGTTTCGGT GATGACGGTG AAAACCTCTG  
7151 ACACATGCAG CTCCCGGAGA CGGTACACAGC TTGTCTGTAA GCGGATGCCG  
7201 GGAGCAGACA AGCCCGTCAG GCGCGTCAG CGGGTGTTGG CGGGTGTCGG  
7251 GGCTGGCTTA ACTATGCGGC ATCAGAGCAG ATTGTACTGA GAGTGCACCA  
7301 TATGCGGTGT GAAATACCGC ACAGATGCGT AAGGAGAAAA TACCGCATCA  
7351 GGCGCCATTC GCCATTGAGG CTGCGCAACT GTTGGGAAGG GCGATCGGTG  
7401 CGGGCCTCTT CGCTATTACG CCAGCTGGCG AAAGGGGGAT GTGCTGCAAG  
7451 GCGATTAAGT TGGGTAACGC CAGGGTTTTTC CCAGTCACGA CGTTGTAAAA  
7501 CGACGGCCAG TGAATTTTGA CCTGCAGtcg acttttttta tatatacagg  
7551 aggcgag

Fig. 20

- 35/56 -

JCVPshort-hgdnf Length: 6565 June 8, 1999 16:57 Type: N Check:

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1 GCTAGCGATT TAGGTGACAC TATAGAATAG ATCCCCATGA AGTTATGGGA
51 TGTCGTGGCT GTCTGCCTGG TGCTGCTCCA CACCGCGTCC GCCTTCCC GC
101 TGCCCGCCGG TAAGAGGCTT CCCGAGGCGC CCGCCGAAGA CCGCTCCCTC
151 GGCCGCGGCC GCGCGCCCTT CGCGCTGAGC AGTGAAGTCA ATATGCCAGA
201 GGATTATCCT GATCAGTTCG ATGATGTCAT GGATTTTATT CAAGCCACCA
251 TTAAGAGACT GAAAAGGTCA CCAGATAAAC AAATGGCAGT GCTTCCTAGA
301 AGAGAGCGGA ATCGGCAGGC TGCAGCTGCC AACCCAGAGA ATTCCAGAGG
351 AAAAGGTCGG AGAGGCCAGA GGGGCAAAAA CCGGGTTGT GTCTTAAGT
401 CAATACATTT AAATGTCAGT GACTTGGGTC TGGGCTATGA AACCAAGGAG
451 GAACTGATTT TTAGGTAAGT CAGCGGCTCT TCGCATGCAG CTGAGACAAC
501 GTACGACAAA ATATTGAAAA ACTTATCCAG AAATAGAAGG CTGGTGAGTG
551 ACAAAGTAGG GCAGGCATGT TGCAGACCCA TCGCCTTTGA TGATGACCTG
601 TCGTTTTTAG ATGATAACCT GGTTTACCAT ATTCTAAGAA AGCATTTCCG
651 TAAAAGGTGT GGATGTATCT GACTGGTGGC CCGTCTTTCC CGACGTTAAA
701 GGGATGAAAC CACAAGACTT ACCTTCGCTC GGAAGTAAAA CGACAAACAC
751 ACACAGTTTT GCCCGTTTTT ATGAGAAATG GGACGCTGTC GCACGAAACG
801 CGCCGTCGCT TGAGGAGGAC TTGTACAAAC ACGATCTATG CAGGTTTCCC
851 CAACTGACAC AAACCGTGCA ACTTGAAACT CCGCCTGGTC TTTCCAGGTC
901 TAGAGGGGTA ACATTTTGTA CTGTGTTGA CTCCACGCTC GATCCACTAG
951 CGAGTGTTAG TAGCGGTACT GCTGTCTCGT AGCGGAGCAT GTTGGCCGTG
1001 GGAACACCTC CTTGGTAACA AGGACCCACG GGGCCGAAAG CCATGCTCTA
1051 ACGGACCCAA CATGTGTGCA ACCCCAGCAC GGCAGCTTTA CTGTGAAACC
1101 CACTTCAAGG TGACATTGAT ACTGGTACTC AAACACTGGT GACAGGCTAA
1151 GGATGCCCTT CAGGTACCCC GAGGTAACAA GCGACACTCG GGATCTGAGA
1201 AGGGGACTGG GACTTCTTTA AAGTGCCAG TTTAAAAAGC TTCTACGCC
1251 GAATAGGTGA CCGGAGGCCG GCACCTTTCC TTTTATAACC ACTGAACACA
1301 TGAAGACGCG CAAAAACATA AAGAAAGGCC CCGCGCCATT CTATCCTCTA
1351 GAGGATGGAA CCGCTGGAGA GCAACTGCAT AAGGCTATGA AGAGATACGC
1401 CCTGGTTTCT GGAACAATTG CTTTTACAGA TGCACATATC GAGGTGAACA
1451 TCACGTACGC GGAATACTTC GAAATGTCCG TTCCGTTGGC AGAAGCTATG
1501 AAACGATATG GGCTGAATAC AAATCACAGA ATCGTCGTAT GCAGTGAAAA
1551 CTCTCTTCAA TTCTTTATGC CCGGTGTTGG GCGCTTATTT ATCGGAGTTG
1601 CAGTTGCGCC CGCGAACGAC ATTTATAATG AACGTGAATT GCTCAACAGT
1651 ATGAACATTT CGCAGCCTAC CGTAGTGTTT GTTCCAAAAA AGGGGTTGCA
1701 AAAAAATTTG AACGTGCAAA AAAAAATTACC AATAATCCAG AAAATTATTA
1751 TCATGGATTG TAAACCGGAT TACCAGGGAT TTCAGTCGAT GTACACGTTT
1801 GTCACATCTC ATCTACCTCC CCGTTTTAAT GAATACGATT TTGTACCAGA
1851 GTCCTTTGAT CGTGACAAA CAATTGCACT GATAATGAAT TCCTCTGGAT
1901 CTACTGGGTT ACCTAAGGGT GTGGCCCTTC CGCATAGAAC TGCCTGCGTC
1951 AGATTCTCGC ATGCCAGAGA TCCTATTTTT GGCAATCAAA TCATTCCGGA
2001 TACTGCGATT TTAAGTGTG TTCCATTCCA TCACGGTTTT GGAATGTTTA
2051 CTACACTCGG ATATTTGATA TGTGGATPCT GAGTCGTCTT AATGTATAGA
2101 TTTGAAGAAG AGCTGTTTTT ACGATCCCTT CAGGATTACA AAATTCAAAG
2151 TGCGTTGCTA GTACCAACCC TATTTTCATT CTTCCGCAAA AGCACTCTGA
2201 TTGACAAATA CGATTTATCT AATTTACAG AAATTGCTTC TGGGGGCGCA
2251 CCTCTTTTCA AAGAAGTCGG GGAAGCGGTT GCAAAACGCT TCCATCTTCC
2301 AGGGATACGA CAAGGATATG GGCTCACTGA GACTACATCA GCTATTCTGA
2351 TTACACCCGA GGGGGATGAT AAACCGGGCG CGGTCGGTAA AGTTGTTCCA
2401 TTTTTTGAAG CGAAGGTTGT GGATCTGGAT ACCGGGAAAA CGCTGGGCGT
2451 TAATCAGAGA GGCGAATTAT GTGTCAGAGG ACCTATGATT ATGTCCGGTT
2501 ATGTAAACAA TCCGGAAGCG ACCAACGCCT TGATTGACAA GGATGGATGG
2551 CTACATTCTG GAGACATAGC TTAGTGGGAC GAAGACGAAC ACTTCTTCAT
2601 AGTTGACCGC TTGAAGTCTT TAATTAAATA CAAAGGATAT CAGGTGGCCC
2651 CCGCTGAATT GGAATCGATA TTGTTACAA ACCCAACAT CTTCCAGCGG
2701 GCGGTGGCAG GTCTTCCCGA CGATGACGCC GGTGAACCTT CCGCCGCGGT
2751 TGTGTTTTTG GAGCACGGAA AGACGATGAC GGAAAAAGAG ATCGTGGATT
2801 ACGTCGCCAG TCAAGTAACA ACCGCGAAAA AGTTGCGCGG AGGAGTTGTG
2851 TTTGTGGACG AAGTACCGAA AGGTCTTACC GGAAAACTCG ACGCAAGAAA
2901 AATCAGAGAG ATCCTCATAA AGGCCAAGAA GGGCCGAAAG TCCAAATTGT
2951 AAAATGTAAC TGTATTGAGC GATGACGAAA TTCTTAGCTA TTGTAATGAC
3001 TCTAGAGGAT CTTTGTGAAG GAACCTTACT TCTGTGGTGT GACATAATTG
3051 GACAACTAC CTACAGAGAT TTAAAGCTCT AAGGTAAATA TAAATTTTTT
3101 AAGTGATATA TGTGTTAAAC TACTGATTCT AATTGTTTGT GTATTTTGA
3151 TTCCAACCTA TGGAACTGAT GAATGGGAGC AGTGGTGAA TGCCTTTAAT

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Fig. 21

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3201 GAGGAAAACC TGTTTTGCTC AGAAGAAATG CCATCTAGTG ATGATGAGGC
3251 TACTGCTGAC TCTCAACATT CTACTCCTCC AAAAAAGAAG AGAAAGGTAG
3301 AAGACCCCAA GGACTTTCCT TCAGAATTGC TAAGTTTTTT GAGTCATGCT
3351 GTGTTTAGTA ATAGAACTCT TGCTTGCTTT GCTATTTTACA CCACAAAGGA
3401 AAAAGCTGCA CTGCTATACA AGAAAATTAT GGAAAAATAT TCTGTAACCT
3451 TTATAAGTAG GCATAACAGT TATAATCATA ACATACTGTT TTTTCTTACT
3501 CCACACAGGC ATAGAGTGTC TGCTATTAAT AACTATGCTC AAAAATTGTG
3551 TACCTTTAGC TTTTAAATTT GTAAAGGGGT TAATAAGGAA TATTTGATGT
3601 ATAGTGCTTT GACTAGAGAT CATAATCAGC CATACCACAT TTGTAGAGGT
3651 TTTACTTGCT TTAAAAAACC TCCCACACCT CCCCCTGAAC CTGAAACATA
3701 AAATGAATGC AATTGTTGTT GTTAACTTGT TTATTGCAGC TTATAATGGT
3751 TACAAATAAA GCAATAGCAT CACAAATTC ACAAATAAAG CATTTTTTTC
3801 ACTGCATTCT AGTTGTGGTT TGTCCAACT CATCAATGTA TCTTATCATG
3851 TCTGGATCCC CGGGTCCCTA TAGTGAGTCG TATTAGCTTG GCGTAATCAT
3901 GGTCATAGCT GTTTCCTGTG TGAAATTGTT ATCCGCTCAC AATTCCACAC
3951 AACATAACGAG CCGGAAGCAT AAAGTGTAAG GCCTGGGGTG CCTAATGAGT
4001 GAGCTAACTC ACATTAATTG CGTTGCGCTC ACTGCCCGCT TTCCAGTCGG
4051 GAAACCTGTC GTGCCAGCTG CATTAAATGAA TCGGCCAACG CGCGGGGAGA
4101 GCGGTTTTCG GTATTGGGCG CTCTTCCGCT TCCTCGCTCA CTGACTCGCT
4151 GCGCTCGGTC GTTCGGCTGC GCGAGCGGT ATCAGCTCAC TCAAAGGCGG
4201 TAATACGGTT ATCCACAGAA TCAGGGGATA ACGCAGGAAA GAACATGTGA
4251 GCAAAAGGCC AGCAAAAGGC CAGGAACCGT AAAAAGGCCG CGTTGCTGGC
4301 GTTTTCCAT AGGCTCCGCC CCCCTGACGA GCATCACAAA AATCGACGCT
4351 CAAGTCAGAG GTGGCGAAAC CCGACAGGAC TATAAAGATA CCAGGCGTTT
4401 CCCCCTGGAA GCTCCCTCGT GCGCTCTCCT GTTCCGACCC TGCCGCTTAC
4451 CGGATACCTG TCCGCCTTTC TCCCTTCGGG AAGCGTGGCG CTTTCTCAAT
4501 GCTCACGCTG TAGGTATCTC AGTTCCGGTGT AGGTCGTTTC CTCCAAGCTG
4551 GGCTGTGTGC ACGAACCCTC CGTTCAGCCC GACCGCTGCG CCTTATCCGG
4601 TAACTATCGT CTTGAGTCCA ACCCGGTAAG ACACGACTTA TCGCCACTGG
4651 CAGCAGCCAC TGGTAACAGG ATTAGCAGAG CGAGGTATGT AGGCGGTGCT
4701 ACAGAGTTCT TGAAGTGGTG GCCTAACTAC GGCTACACTA GAAGGACAGT
4751 ATTTGGTATC TGCGCTCTGC TGAAGCCAGT TACCTTCGGA AAAAGAGTTG
4801 GTAGCTCTTG ATCCGGCAAA CAAACCACCG CTGGTAGCGG TGTTTTTTTT
4851 GTTTGCAAGC AGCAGATTAC GCGCAGAAAA AAAGGATCTC AAGAAGATCC
4901 TTTGATCTTT TCTACGGGGT CTGACGCTCA GTGGAACGAA AACTCACGTT
4951 AAGGGATTTT GGTCATGAGA TTATCAAAAA GGATCTTCAC CTAGATCCTT
5001 TTAAATTAAT AATGAAGTTT TAAATCAATC TAAAGTATAT ATGAGTAAAC
5051 TTGGTCTGAC AGTTACCAAT GCTTAATCAG TGAGGCACCT ATCTCAGCGA
5101 TCTGTCTATT TCGTTTATCC ATAGTTGCCT GACTCCCCGT CGTGTAGATA
5151 ACTACGATAC GGGAGGGCTT ACCATCTGGC CCCAGTGCTG CAATGATACC
5201 GCGAGACCCA CGCTCACCGG CTCCAGATTT ATCAGCAATA AACCAGCCAG
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5301 CAGTCTATTA ATTGTTGCCG GGAAGCTAGA GTAAGTAGTT CGCCAGTTAA
5351 TAGTTTGCGC AACGTTGTTG CCATTGCTAC AGGCATCGTG GTGTCACGCT
5401 CGTCGTTTGG TATGGCTTCA TTCAGCTCCG GTTCCCAACG ATCAAGGCGA
5451 GTTACATGAT CCCCATGTT GTGCAAAAAA GCGGTTAGCT CCTTCGGTCC
5501 TCCGATCGTT GTCAGAAGTA AGTTGGCCGC AGTGTTATCA CTCATGGTTA
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5601 TCTGTGACTG GTGAGTACTC AACCAGTCA TTCTGAGAAT AGTGTATGCG
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5751 AAACCTCTCA GGATCTTACC GCTGTTGAGA TCCAGTTCGA TGTAAACCCAC
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6251 GTGTCGGGGC TGGCTTAACT ATGCGGCATC AGAGCAGATT GTACTGAGAG
6301 TGCACCATAT GCGGTGTGAA ATACCGCACA GATGCGTAAG GAGAAAAATAC
6351 CGCATCAGGC GCCATTTCGC ATTCAGGCTG CGCAACTGTT GGAAGGGCG
6401 ATCGGTGCGG GCCTCTTCGC TATTACGCCA GCTGGCGAAA GGGGGATGTG
6451 CTGCAAGGCG ATTAAGTTGG GTAACGCCAG GGTTTTCCA GTCACGACGT
6501 TGTAACACGA CGGCCAGTGA ATTCGACCT GCAGTcgact ttttttatat

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Fig. 21



- 37/56 -

6551 atacaggagg ccgag

Fig. 21

- 38/56 -

pRetroOFF-E6E7 Length: 7840 June 10, 1999 12:21 Type: N Check: 5234

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1 TCGAGTTTAC CACTCCCTAT CAGTGATAGA GAAAAGTGAA AGTCGAGTTT
51 ACCACTCCCT ATCAGTGATA GAGAAAAGTG AAAGTCGAGT TTACCACTCC
101 CTATCAGTGA TAGAGAAAGT GAAAGTCGAG TTTACCACTC CCTATCAGTG
151 ATAGAGAAAA GTGAAAGTCG AGTTTACCAC TCCCTATCAG TGATAGAGAA
201 AAGTGAAAGT CGAGTTTACC ACTCCCTATC AGTGATAGAG AAAAGTGAAG
251 TCGAGTTTAC CACTCCCTAT CAGTGATAGA GAAAAGTGAA AGTCGAGCTC
301 GGTACCCGGG TCGAGTAGGC GTGTACGGTG GGAGGCCTAT ATAAGCAGAG
351 CTCGTTTGTG GAACCGTCAG ATCGCCTGGA GACGCCATCC ACGCTGTTTT
401 GACCTCCATA GAAGACACCG GGACCGATCC AGCCTGcggc cgcagatcta
451 attcaccggt tagtataaaa gcagacattt tatgcaccaa aagagaactg
501 caatgtttca ggacccacag gagegcacca gaaagttacc acagttatgc
551 acagagctgc aaacaactat acatgatata atattagaat gtgtgtactg
601 caagcaacag ttactgcgac gtgaggtata tgactttgct ttcgggatt
651 tatgcatagt atatagagat gggaaatccat atgctgtatg tgataaatgt
701 ttaaagtgtt attctaaaat tagtgagtat agacattatt gttatagttt
751 gtatggaaca acattagaac agcaatacaa caaacggttg tgtgatttgt
801 taattaggtg tattaactgt caaaagccac tgtgtcctga agaaaagcaa
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901 cggtcgatgt atgtcttggt gcagatcatc aagaacacgt agagaaaacc
951 agctgtaatc atgcatggag atacacctac attgcatgaa tatatgttag
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1851 TTTAAGTTGT TTTTCTAATC CGCATATGAT CAATTCAAGG CCGAATAAGA
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1951 AATGGCGGCA TACTATCAGT AGTAGGTGTT TCCCTTTCTT CTTTAGCGAC
2001 TTGATGCTCT TGATCTTCCA ATACGCAACC TAAAGTAAAA TGCCCCACAG
2051 CGCTGAGTGC ATATAATGCA TTCTCTAGTG AAAAACCTTG TTGGCATAAA
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2151 ACCTAAATGT ACTTTTGCTC CATCGGATG ACTTAGTAAA GCACATCTAA
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2351 CACCTAGCTT CTGGGCGAGT TTACGGGTTG TTAACCTTC GATTCCGACC
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3101 GGTGCGGCGA GACGCCGACG GTGGCCAGGA ACCACGCGGG CTCCTTGGGC
3151 CGGTGCGGCG CCAGGAGGCC TTCCATCTGT TGCTGCGCGG CCAGCCGGGA

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 3251 CTTGACGCT CTCCGGCGTG GTCCAGACCG CCACCGCGGC GCCGTCTGCC  
 3301 GCGACCCACA CCTTGCCGAT GTCCAGCCCG ACACGCGTGA GGAAGAGTTC  
 3351 TTGCAGCTCG GTGACCCGCT CGATGTGGCG GTCCGGATCG ACGGTGTGGC  
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 3451 GGGACGTCGT CGCGGGGTGGC GAGGCGCACC GTGGGCTTGT ACTCGGTCAT  
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 3551 GGAGGATTGA GCGGGGGTCG AAAGAGGAGG TTCAAGGGGG AGAGACGGCG  
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 3651 CAGGGAGGGG GGTCAAAAGC CAAGGCTTCC CAGGTCACGA TGTAGGGGAC  
 3701 CTGGTCTGGG TGTCCATGCG GGCCAGGTGA AAAGACCTTG ATCTTAACCT  
 3751 GGGTGATGAG GTCTCGGTTA AAGGTGCCGT CTCGCGGCCA TCCGACGTTA  
 3801 AAGGTTGGCC ATTCTGCAGA GCAGAAGGTA ACCCAACGTC TCTTCTTGAC  
 3851 ATCTACCGAC TGGTGTGAG CGAGCCGCTC GACATCTTTC CAGTGATCTA  
 3901 AGGTCAAAC TAAGGGAGTG GTAACAGTCT GGCCCTAATT TTCAGACAAA  
 3951 TACAGAAACA CAGTCAGACA GAGACAACAC AGAACGATGC TGCAGCAGAC  
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 4051 GGGAACTGTT TTAGGTTCTC GTCTCCTACC AGAACACAT ATCCTGACGG  
 4101 GGTCGGATTG CATATCGACT CCCTTCCTCA GGTGCGGCCA CAAAACGGC  
 4151 CCCCAAAGTC CCTGGGACGT CTCCCAGGTG TCGGGCCGGG TGTTCAGAAC  
 4201 TCGTCAGTTC CACCACGGGT CCGCCAGATA CAGAGCTAGT TAGCTAATA  
 4251 GTACCGACGC AGGCGCATAA AATCAGTCAT AGACACTAGA CAATCGGACA  
 4301 GACACAGATA AGTTGCTGGC CAGCTTACCT CCCGGTGGTG GGTGCGTGGT  
 4351 CCCTGGGCAG GGGTCTCCCG ATCCCGGACG AGCCCCCAA TGAAAGACCC  
 4401 CCGCTGACGG GTAGTCAATC ACTCAGAGGA GACCCTCCCA AGGAACAGCG  
 4451 AGACCACAAG TCGGATGCAA CTGCAAGAGG GTTTATTGGA TACACGGGTA  
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 4551 GGGCTCTTTT ATTGAGCTCG GGGAGCAGAA GCGCGGAAC AGAAGCGAGA  
 4601 AGCGAACTGA TTGGTTAGTT CAAATAAGGC ACAGGGTCAT TTCAGTCTCT  
 4651 TGGGGCACCC TGGAAACATC TGATGGTTCT CTAGAACTG CTGAGGGCTG  
 4701 GACCGCATCT GGGGACCATC TGTTCTTGGC CCTGAGCCGG GGCAGGAAT  
 4751 GCTTACCACA GATATCTGT TTGGCCATA TTCAGCTGTT CCATCTGTTT  
 4801 TTGGCCCTGA GCGGGGGCAG GAACTGCTTA CCACAGATAT CCTGTTTGGC  
 4851 CCATATTGAG GCTGCAGGTG GCACTTTTCG GGGAAATGTG CGCGGAACCC  
 4901 CTATTTGTTT ATTTTCTAA ATACATTCAA ATATGTATCC GCTCATGAGA  
 4951 CAATAACCCCT GATAAATGCT TCAATAATAT TGAAAAAGGA AGAGTATGAG  
 5001 TATTCAACAT TTCCGTGTCG CCCTTATTCC CTTTTTTGCG GCATTTTGCC  
 5051 TTCCTGTTTT TGCTCACCAG GAAACGCTGG TGAAAGTAAA AGATGCTGAA  
 5101 GATCAGTTGG GTGCACGAGT GGGTTACATC GAACTGGATC TCAACAGCGG  
 5151 TAAGATCCTT GAGAGTTTTC GCCCCGAAGA ACCTTTTCCA ATGATGAGCA  
 5201 CTTTTAAAGT TCTGCTATGT GCGCGGGTAT TATCCCGTGT TGACGCCGGG  
 5251 CAAGAGCAAC TCGGTGCGCG CATACACTAT TCTCAGAAATG ACTTGGTTGA  
 5301 GTACTCACCA GTCACAGAAA AGCATCTTAC GGATGGCATG ACAGTAAGAG  
 5351 AATTATGCAG TGCTGCCATA ACCATGAGTG ATAACACTGC GGCCAACTTA  
 5401 CTCTGACAA CGATCGGAGG ACCGAAGGAG CTAAACGCTT TTTTGCACAA  
 5451 CATGGGGGAT CATGTAATC GCCTTGATCG TTGGGAACCG GAGCTGAATG  
 5501 AAGCCATACC AAACGACGAG CGTGACACCA CGATGCCTGT AGCAATGGCA  
 5551 ACAACGTTGC GCAAACATT AACTGGCGAA CTACTTACTC TAGCTTCCCG  
 5601 GCAACAATTA ATAGACTGGA TGGAGGCGGA TAAAGTTGCA GGACCACTTC  
 5651 TCGCTCGGC CCTTCCGGCT GGCTGGTTTA TTGCTGATAA ATCTGGAGCC  
 5701 GGTGAGCGTG GGTCTCGCGG TATCATTGCA GCACTGGGGC CAGATGGTAA  
 5751 GCCCTCCCGT ATCGTAGTTA TCTACACGAC GGGGAGTCAG GCAACTATGG  
 5801 ATGAACGAAA TAGACAGATC GCTGAGATAG GTGCCTCACT GATTAAGCAT  
 5851 TGGTAACTGT CAGACCAAGT TTAATTTAAA AGGATCTAGG TGAAGATCCT  
 5901 GCCGGCCGCA AACTTCATTT TTAATTTAAA AGGATCTAGG TGAAGATCCT  
 5951 TTTTGATAAT CTCATGACCA AAATCCCTTA ACGTGAGTTT TCGTTCCACT  
 6001 GAGCGTCAGA CCCCCTAGAA AAGATCAAAG GATCTTCTTG AGATCCTTTT  
 6051 TTTCTGCGCG TAATCTGCTG CTGCAAACA AAAAAACCAC CGCTACCAGC  
 6101 GGTGGTTTGT TTGCGGATC AAGAGCTACC AACTCTTTTT CCGAAGGTAA  
 6151 CTGGCTTCAG CAGAGCGCAG ATACCAAATA CTGTCCTTCT AGTGTAGCCG  
 6201 TAGTTAGGCC ACCACTTCAA GAACTCTGTA GCACCGCCTA CATACCTCGC  
 6251 TCTGCTAATC CTGTTACCA TGGCTGCTGC CAGTGGCGAT AAGTCGTGTC  
 6301 TTACCGGGTT GGAATCAAGA CGATAGTTAC CGGATAAGGC GCAGCGGTGCG  
 6351 GGCTGAACGG GGGGTTCTGT CACACAGCCC AGCTTGGAGC GAACGACCTA  
 6401 CACCGAATG AGATACCTAC AGCGTGAGCT ATGAGAAAGC GCCACGCTTC  
 6451 CCGAAGGGAG AAAGGCGGAC AGGTATCCGG TAAGCGGCAG GGTGCGGAACA  
 6501 GGAGAGCGCA CGAGGGAGCT TCCAGGGGGA AACGCCTGGT ATCTTTATAG

Fig. 22

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6551 TCCTGTCGGG TTTCGCCACC TCTGACTTGA GCGTCGATTT TTGTGATGCT  
6601 CGTCAGGGGG GCGGAGCCTA TGGAAAAACG CCAGCAACGC GGCCTTTTTTA  
6651 CGGTTTCCTGG CCTTTTGCTG GCCTTTTGCT CACATGTTCT TTCCTGCGTT  
6701 ATCCCTTGAT TCTGTGGATA ACCGTATTAC CGCCTTTGAG TGAGCTGATA  
6751 CCGCTCGCCG CAGCCGAACG ACCGAGCGCA GCGAGTCAGT GAGCGAGGAA  
6801 GCGGAAGAGC GCCAATACGC AAACCGCCTC TCCCCGCGCG TTGGCCGATT  
6851 CATTAAATGCA ACTATGGCCA TTTAATGTAA ATACTTAAGA AAAAAACCA  
6901 AATTAATTTT GATACATGCT GCATGTGAAG ACCCCGCTG ACGGGTAGTC  
6951 AATCACTCAG AGGAGACCTT CCCAAGGCAG CGAGACCACA AGTCGGAAT  
7001 GAAAGACCCC CGCTGACGGG TAGTCAATCA CTCAGAGGAG ACCCTCCCAA  
7051 GGAACAGCGA GACCACAAGT CGGATGCAAC TGCAAGAGGG TTTATTGGAT  
7101 ACACGGGTAC CCGGGCGACT CAGTCAATCG GAGGACTGGC GCCCGAGTG  
7151 AGGGGTTGTG GGCTCTTTTA TTGAGCTCGG GGAGCAGAAG CGCGCGAACA  
7201 GAAGCGAGAA GCGAACTGAT TGGTTAGTTC AAATAAGGCA CAGGGTCATT  
7251 TCAGGTCCTT GGGGCACCTT GGAAACATCT GATGGTTCTC TAGAACTGC  
7301 TGAGGGCTGG ACCGCATCTG GGGACCATCT GTTCTTGCC CTGAGCCGGG  
7351 GCAGGAAC TGCTTACCACAG ATATCCTGTT TGGCCCATAT TCAGCTGTTT  
7401 CATCTGTTCT TGGCCCTGAG CCGGGGCAGG AACTGCTTAC CAGAGATATC  
7451 CTGTTTGCC CATATTCAGC TGTTCCATCT GTTCCTGACC TTGATCTGAA  
7501 CTTCTCTATT CTCAGTTATG TATTTTCCA TGCCTTGCAA AATGGCGTTA  
7551 CTTAAGCTAG CAGATCTGCT AGCTTGCCAA ACCTACAGGT GGGGTCTTTC  
7601 ATTCCCCCT TTTTCTGGAG ACTAAATAAA ATCTTTTATT TTATGCGCAC  
7651 ATTTCCCCGA AAAGTGCCAC CTGACGTCTA AGAAACCATT ATTATCATGA  
7701 CATTAACTA TAAAAATAGG CGTATCACGA GGCCCTTTCG TCCGCACATT  
7751 TCCCCGAAAA GTGCCACCTG ACGTCTAAGA AACCATTATT ATCATGACAT  
7801 TAACCTATAA AAATAGGCGT ATCACGAGGC CCTTTCGTCC

Fig. 22

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pRetroOFF-U19tsa58 Length: 8852

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1   TCGAGTTTAC CACTCCCTAT CAGTGATAGA GAAAAGTGAA AGTCGAGTTT
51  ACCACTCCCT ATCAGTGATA GAGAAAAGTG AAAGTCGAGT TTACCACTCC
101 CTATCAGTGA TAGAGAAAAGT GAAAGTCGAG TTTACCACTC CCTATCAGTG
151 ATAGAGAAAA GTGAAAGTCG AGTTTACCAC TCCCTATCAG TGATAGAGAA
201 AAGTGAAAAGT CGAGTTTACC ACTCCCTATC AGTGATAGAG AAAAGTGAAG
251 TCGAGTTTAC CACTCCCTAT CAGTGATAGA GAAAAGTGAA AGTCGAGCTC
301 GGTACCCGGG TCGAGTAGGC GTGTACGGTG GGAGGCCTAT ATAAGCAGAG
351 CTCGTTTAGT GAACCGTCAG ATCGCCTGGA GACGCCATCC ACGCTGTTTT
401 GACCTCCATA GAAGACACCG GGACCGATCC AGCCTGCGGC CGCTTAATTA
451 AGTTTAAACG GATCCxxxxx xxxxxxatgc catctagtga tgatgaggct
501 actgctgact ctcaacattc tactcctcca aaaaagaaga gaaaggtaga
551 agaccccaag gactttcctt cagaattgct aagttttttg agtcatgctg
601 tgtttagtaa tagaactctt gcttgctttg ctatttacac cacaaggaa
651 aaagctgcac tgctatacaa gaaaattatg gaaaaatatt ctgtaacctt
701 tataagtagg cataacagtt ataatacata catactgttt tttcttactc
751 cacacaggca tagagtgtct gctattaata actatgctca aaaatttgtt
801 accttttagt ttttaatttg taaaggggtt aataaggaat atttgatgta
851 tagtgccttg actagagatc cattttctgt tattgaggaa agtttgccag
901 gtgggttaaa ggagcatgat tttaatccag aagaagcaga ggaaactaaa
951 caagtgtcct ggaagcttgt aacagagtat gcaatggaaa caaatgtga
1001 tgatgtgttg ttattgcttg ggatgtactt ggaatttcag tacagttttg
1051 aaatgtgttt aaaatgtatt aaaaaagaac agccagcca ctataagtac
1101 catgaaaaagc attatgcaaa tgctgctata ttgctgaca gcaaaaaacca
1151 aaaaaccata tgccaacagg ctgttgatac tgtttttagt aaaaagcggg
1201 ttgatagcct acaattaaact agagaacaaa tgtaacaaa cagatttaat
1251 gatcttttgg ataggatgga tataatgttt ggttctacag gctctgctga
1301 catagaagaa tggatggctg gactttttaa aatgcatggt gtacaacatt
1351 aaatggattc agtgggtgat gtttaagga ccaattgata gtggtaaaac
1401 cctaaaaaaa gatactggct ttgaattatg tgggggaaa gctttaaatg
1451 tacattagca gctgctttgc ctgaactttg agctaggagt agctattgac
1501 ttaatttgcc ctggacagg ctgaactttg agctaggagt agctattgac
1551 cagtttttag tagtttttga ggatgtaaag ggcactggag gggagtccag
1601 agatttgcc tcaaggcagg gaattaataa cctggacaat ttaagggatt
1651 atttgatggc cagtgttaag gtaaaactag aaaagaaaca cctaaataaa
1701 agaactcaaa tatttcccc tggaatagtc accatgaatg agtacagtgt
1751 gcctaaaaaca ctgcaggcca gatttgtaaa acaaatagat tttaggccca
1801 aagattattt aaagcattgc ctggaacgca gtgagttttt gttagaaaag
1851 agaataattc aaagtggcat tgctttgctt cttatgttaa tttggtacag
1901 acctgtggct gagtttgcct aaagtattca gagcagaatt gtggagtggg
1951 aagagagatt ggacaaaag ttttagttgt cagtgtatca aaaaatgaag
2001 tttaatgtgg ctatgggaat tggagtttta gattggctaa gaaacagtga
2051 tgatgatgat gaagacagcc aggaaaatgc tgataaaaat gaagatggtg
2101 gggagaagaa catggaagac tcagggcagtg aaacaggcat tgattcacag
2151 tcccaaggct catttcaggc ccctcagtc tcacagctctg ttcattgatc
2201 taatcagcca taccacattt gttagggttt tacttgcttt aaaaaacctc
2251 ccacacctcc ccctgaacct gaaacataax xxxxxxxxxxxx ggatccCCCG
2301 GGAACAACAA CAATTGCATT CATTTTATGT TTCAGGTTCA GGGGGAGGTG
2351 TGGGAGGTTT TTAAAGCAA GTAAAACCTC TACAAATGTG GTATGGCTGA
2401 TTATGATCCT GCAAGCCTCG TCGTCTGGCC GGACACGCT ATCTGTGCAA
2451 GGTCCCGGGA CGCGCGCTCC ATGAGCAGAG CGTCGCGCCC CCTACCCACC
2501 GTACTCGTCA ATTECAAGGG CATCGGTAAA CAGAGCGCCG TAGGGGGCGG
2551 AGTCGTGGGG GGTAAATCCC GGACCCGGGG AATCCCGCTC CCCCAACATG
2601 TCCAGATCGA AATCGTCTAG CGCGTCGGCA TCGCCATCG CCACGTCTCT
2651 GCCGTATAAG TGGAGCTCGT CCCCAGGCT GACATCGGT GGGGGGGCGG
2701 TCGACAGTCT CGCGTGTGT CCGCGGGGAG AAAGGACAGG CGCGGAGCCG
2751 CCAGCCCCGC CTCTTCGGGG GCGTCGTCGT CCGGGAGATC GAGCAGGCCC
2801 TCGATGGTAG ACCCGTAATT GTTTTCTGTA CGCGCGCGGC TGTACGCGGA
2851 CCCACTTTCA CATTTAAGTT GTTTTCTAA TCCGCATATG ATCAATTCAA
2901 GGCCGAATAA GAAGGCTGGC TCTGCACCTT GGTGATCAAA TAATTCGATA
2951 GCTTGTCTGA ATAATGGCG CATACTATCA GTAGTAGGTG TTTCCCTTTC
3001 TTCTTTAGCG ACTTGATGCT CTTGATCTTC CAATACGCAA CCTAAAGTAA
3051 AATGCCCCAC AGCGCTGAGT GCATATAATG CATTCTCTAG TGAAAAACCT
3101 TGTTGGCATA AAAAGGCTAA TTGATTTTCG AGAGTTTCAT ACTGTTTTTC
3151 TGTAGGCCGT GTACCTAAAT GTACTTTTGC TCCATCGCGA TGACTTAGTA
3201 AAGCACATCT AAAACTTTTA CGGTTATTAC GTAAAAATC TTGCCAGCTT

```

Fig. 23

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3251 TCCCTTCTA AAGGGCAAAA GTGAGTATGG TGCCTATCTA ACATCTCAAT  
 3301 GGCTAAGGCG TCGAGCAAAG CCCGCTTATT TTTTACATGC CAATACAATG  
 3351 TAGGCTGCTC TACACCTAGC TTCTGGGCGA GTTTACGGGT TGTAAACCT  
 3401 TCGATTCCGA CCTCATTAAG CAGCTCTAAT GCGCTGTAA TCACTTTACT  
 3451 TTTATCTAAT CTAGACATGG TGAAGCTTT TTGCAAAAGC CTAGGCCTCC  
 3501 AAAAAAGCCT CCTCACTACT TCTGGAATAG CTCAGAGGCC GAGGCGGCCT  
 3551 CGGCCTCTGC ATAAATAAAA AAAATTAGTC AGCCATGGGG CGGAGAATGG  
 3601 GCGGAACCTGG GCGGAGTTAG GGGCGGGATG GCGGAGTTA GGGGCGGGAC  
 3651 TATGGTTGCT GACTAATTGA GATGCATGCT TTGCATACTT CTGCCTGCTG  
 3701 GGGAGCCTGG GGAATTCCA CACTGGTTG CTGACTAATT GAGATGCATG  
 3751 CTTTGCATAC TTCTGCCTGC TGGGGAGCCT GGGGACTTTC CACACCCTAA  
 3801 CTGACACACA TTCCACAGGT CGACTAGATC GAATTCTCAA TGTTTTACG  
 3851 CGGCCGATG CATGGGGTCG TGCCTCCTT TCGGTCGGGC GCTGCGGGTC  
 3901 GTGGGGCGGG CGTCAGGCAC CCGGCTTGGC GGTTCATGCAC CAGGTCGCGC  
 3951 GGTCTTTCGG GCACTCGACG TCGGCGGTGA CCGTGAAGCC GAGCCGCTCG  
 4001 TAGAAGGGGA GGTTCGCGGG CGCGGAGGTC TCCAGGAAGG CGGGCACCCC  
 4051 GCGCGCTCG GCGGCTCCA CTCCGGGGAG CACGACGGCG CTGCCCAGAC  
 4101 CCTTGGCCCTG GTGGTCGGGC GAGACGCCGA CCGTGGCCAG GAACCACGCG  
 4151 GGCTCCTTGG GCGGTCGGC CGCCAGGAGG CTTTCCATCT GTTGTGCGC  
 4201 GGCCAGCCGG GAACCGCTCA ACTCGGCCAT GCGCGGGCCG ATCTCGGCGA  
 4251 ACACCGCCCC CGCTTCGACG CTCTCCGGCG TGGTCCAGAC CGCCACCGCG  
 4301 GCGCCGTCGT CCGCGACCCA CACCTTGCCG ATGTCGAGCC CGACGCGCGT  
 4351 GAGGAAGAGT TCTTGCAGCT CGGTGACCCG CTCGATGTGG CCGTCCGGAT  
 4401 CGACGGTGTG GCGCGTGGCG GGTAGTCGG CGAACGCGGC GCGGAGGGTG  
 4451 CGTACGGCCC TGGGACGTC GTCGCGGGTG GCGAGGCGCA CCGTGGGCTT  
 4501 GTACTCGGTC ATGGTAAGCT GATCCGGCCG GCGCCTAGAG AAGGAGTGAG  
 4551 GGCTGGATAA AGGGAGGATT GAGGCGGGGT CGAAAGAGGA GGTTCAGGG  
 4601 GGAGAGACGG CGCGGATGGA AGAAGAGGAG GCGGAGGCTT AGGGTGATCA  
 4651 AAGGGCTTGA CCCAGGGAGG GGGGTCAAAA GCCAAGGCTT CCCAGGTCAC  
 4701 GATGTAGGGG ACCTGGTCTG GGTGTCCATG CCGGCCAGGT GAAAAGACCT  
 4751 TGATCTTAAC CTGGGTGATG AGGTCTCGGT TAAAGGTGCC GTCTCGGCGC  
 4801 CATCCGACGT TAAAGGTTGG CCATTCTGCA GAGCAGAAGG TAACCCAACG  
 4851 TCTCTTCTTG ACATCTACCG ACTGGTTGTG AGCGAGCCGC TCGACATCTT  
 4901 TCCAGTGATC TAAGGTCAAA CTTAAGGGAG TGGTAACAGT CTGGCCCTAA  
 4951 TTTTCAGACA AATACAGAAA CACAGTCAGA CAGAGACAAC ACAGAACGAT  
 5001 GCTGCAGCAG ACAAGACGCG CGGCTTCGGT TCCAAACCGA AAGCAAAAAT  
 5051 TCAGACGGAG GCGGGAATG TTTTAGGTTT TCGTCTCCTA CCAGAACCAC  
 5101 ATATCCTGAC GGGGTGCGAT TCCACATCGA CTCCCTTCCT CAGGTCGGGC  
 5151 CACAAAAACG GCGCCCAAAG TCCCTGGGAC GTCTCCAGG GTTGGCGCCG  
 5201 GGTGTTTACA ACTCGTCAGT TCCACCACGG GTCCGCCAGA TACAGAGCTA  
 5251 GTTAGCTAAC TAGTACCGAC GCAGGCGCAT AAAATCAGTC ATAGACACTA  
 5301 GACAATCGGA CAGACACAGA TAAGTTGCTG GCCAGCTTAC CTCCCGGTGG  
 5351 TGGGTGCGTG GTCCCTGGGC AGGGGTCTCC CGATCCCGGA CGAGCCCCCA  
 5401 AATGAAGAC CCGCGTACG GGGTAGTCAA TCACTCAGAG GAGACCCTCC  
 5451 CAAGGAACAG CGAGACCACA AGTCGGATGC AACTGCAAGA GGGTTTATTG  
 5501 GATACACGGG TACCGGGGCG ACTCAGTCAA TCGGAGGACT GCGCCCCGA  
 5551 GTGAGGGGTT GTGGCTCTT TTATTGAGCT CGGGGAGCAG AAGCGCGCGA  
 5601 ACAGAAGCGA GAAGCGAAGT GATTGGTTAG TTCAAATAAG GCACAGGGTC  
 5651 ATTTCAAGTC CTTGGGGCAC CCTGGAAACA TCTGATGGTT CTCTAGAAAC  
 5701 TGCTGAGGGC TGGACCGCAT CTGGGGACCA TCTGTTCTTG GCCCTGAGCC  
 5751 GGGGCAGGAA CTGCTTACCA CAGATATCCT GTTTGGCCCA TATTAGCTG  
 5801 TTCCATCTGT TCTTGGCCCT GAGCCGGGGC AGGAAGTGT TACCACAGAT  
 5851 ATCCTGTTTG GCCCATATTC AGGCTGCAGG TGGCACTTTT CCGGGAAATG  
 5901 TGCGCGGAAC CCCTATTTGT TTATTTTCT AAATACATTC AAATATGTAT  
 5951 CCGCTCATGA GACAATAACC CTGATAAATG CTTCAATAAT ATTGAAAAAG  
 6001 GAAGAGTATG AGTATTCAAC ATTTCCGTGT CGCCCTTATT CCCTTTTTTG  
 6051 CGGCATTTTG CTTCTCTGTT TTTGCTCACC CAGAAACGCT GGTGAAAGTA  
 6101 AAAGATGCTG AAGATCAGTT GGGTGACGTA GTGGGTGACA TCGAACTGGA  
 6151 TCTCAACAGC GGTAAAGATCC TTGAGAGTTT TCGCCCCGAA GAACGTTTTC  
 6201 CAATGATGAG CACTTTTAAA GTTCTGCTAT GTGGCGCGGT ATTATCCCGT  
 6251 GTTGACGCGG GCGAAGAGCA ACTCGGTCG CGCATACACT ATTCTCAGAA  
 6301 TGACTTGGTT GACTACTCAC CACTCACAGA AAAGCATCTT ACGGATGGCA  
 6351 TGACAGTAAG AGAATTATGC AGTGCTGCCA TAACCATGAG TGATAACACT  
 6401 GCGGCCAAT TACTTCTGAC AACGATCGGA GGACCGAAGG AGCTAACCGC  
 6451 TTTTTTGCAC AACATGGGGG ATCATGTAAC TCGCCTTGAT CGTTGGGAAC  
 6501 CGGAGCTGAA TGAAGCCATA CCAAACGAC AGCGTGACAC CACGATGCCT  
 6551 GTAGCAATGG CAACAACGTT GCGCAAACCTA TTAAGTGGCG AACTACTTAC

Fig. 23

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6601 TCTAGCTTCC CGGCAACAAT TAATAGACTG GATGGAGGCG GATAAAGTTG  
 6651 CAGGACCACT TCTGCGCTCG GCCCTTCCGG CTGGCTGGTT TATTGCTGAT  
 6701 AAATCTGGAG CCGGTGAGCG TGGGTCTCGC GGTATCATTG CAGCACTGGG  
 6751 GCCAGATGGT AAGCCCTCCC GTATCGTAGT TATCTACACG ACGGGGAGTC  
 6801 AGGCAACTAT GGATGAACGA AATAGACAGA TCGTGAGAT AGGTGCCTCA  
 6851 CTGATTAAGC ATTGGTAAC TGCAGACCAA GTTTACTCAT ATATACTTTA  
 6901 GATTGATTTG CGGCCGGCCG CAAACTTCAT TTTTAATTTA AAAGGATCTA  
 6951 GGTGAAGATC CTTTTTGATA ATCTCATGAC CAAAATCCCT TAACGTGAGT  
 7001 TTTCTGTTCCA CTGAGCGTCA GACCCCGTAG AAAAGATCAA AGGATCTTCT  
 7051 TGAGATCCTT TTTTCTGCG CGTAATCTGC TGCTTGCAA CAAAAAACC  
 7101 ACCGCTACCA GCGGTGGTTT GTTTGCCGGA TCAAGAGCTA CCAACTCTTT  
 7151 TTCCGAAGGT AACTGGCTTC AGCAGAGCGC AGATACCAA TACTGTCCTT  
 7201 CTAGTGAGC CGTAGTTAGG CCACCACTTC AAGAACTCTG TAGCACCGCC  
 7251 TACATACCTC GCTCTGCTAA TCCTGTACC AGTGGCTGCT GCCAGTGGCG  
 7301 ATAAGTCGTG TCTTACCGG TTGGACTCAA GACGATAGTT ACCGATAAAG  
 7351 GCGCAGCGGT CGGGCTGAAC GGGGGGTTG TGACACAGC CCAGCTTGGG  
 7401 GCGAACGACC TACACCGAAC TGAGATACCT ACAGCGTGAG CTATGAGAAA  
 7451 GCGCCACGCT TCCCGAAGGG AGAAAGGCGG ACAGGTATCC GGTAAGCGGC  
 7501 AGGGTCGGAA CAGGAGAGCG CACGAGGGAG CTTCCAGGGG GAAACGCCTG  
 7551 GTATCTTTAT AGTCCTGTG GGTTCGCCA CCTCTGACTT GAGCGTCGAT  
 7601 TTTTGTGATG CTCGTGAGG GGGCGGAGCC TATGGAAAA CGCCAGCAAC  
 7651 GCGGCCTTTT TACGGTTCCT GGCCTTTTGC TGGCCTTTTG CTCACATGTT  
 7701 CTTTCTGCG TTATCCCTG ATTCTGTGGA TAACCGTATT ACCGCCTTTG  
 7751 AGTGAGCTGA TACCGCTCGC CGCAGCCGAA CGACCGAGCG CAGCGAGTCA  
 7801 GTGAGCGAGG AAGCGGAAGA GCGCCAATAC GCAAACCGCC TCTCCCCGCG  
 7851 CGTTGGCCGA TTCATTAATG CAACTATGGC CATTTAATGT AAATACTTAA  
 7901 GAAAAAAAC CAAATTAATT TTGATACATG CTGCATGTGA AGACCCCCGC  
 7951 TGACGGGTAG TCAATCACTC AGAGGAGACC CTCCCAAGGC AGCGAGACCA  
 8001 CAAGTCGGAA ATGAAAGACC CCCGCTGACG GGTAGTCAAT CACTCAGAGG  
 8051 AGACCCTCCC AAGGAACAGC GAGACCACAA GTCGGATGCA ACTGCAAGAG  
 8101 GGTATTATTG ATACACGGGT ACCCGGGCGA CTCAGTCAAT CGGAGGACTG  
 8151 GCGCCCCGAG TGAGGGGTTG TGGGCTCTTT TATTGAGCTC GGGGAGCAGA  
 8201 AGCGCGCGAA CAGAAGCGAG AAGCGAACTG ATTGGTTAGT TCAAATAAGG  
 8251 CACAGGGTCA TTTCAGGTCC TTGGGGCACC CTGGAAACAT CTGATGGTTC  
 8301 TCTAGAACT GCTGAGGGCT GGACCGCATC TGGGGACCAT CTGTTCTTGG  
 8351 CCCTGAGCCG GGGCAGGAAC TGCTTACCAC AGATATCCTG TTTGGCCCAT  
 8401 ATTCAGCTGT TCCATCTGTT CTTGGCCCTG AGCCGGGGCA GGAAGTGTCT  
 8451 ACCACAGATA TCCTGTTTGG CCCATATTCA GCTGTTCCAT CTGTTCTTGA  
 8501 CCTTGATCTG AACTTCTCTA TTCTCAGTTA TGTATTTTTC CATGCCTTGC  
 8551 AAAATGGCGT TACTTAAGCT AGCAGATCTG CTAGCTTGCC AAACCTACAG  
 8601 GTGGGGTCTT TCATTCCCC CTTTTTCTGG AGACTAAATA AAATCTTTTA  
 8651 TTTTATGCGC ACATTTCCCC GAAAAGTGCC ACCTGACGTC TAAGAAACCA  
 8701 TTATTATCAT GACATTAACC TATAAAAATA GGCGTATCAC GAGGCCCTTT  
 8751 CGTCCGCACA TTTCCCCGAA AAGTGCCACC TGACGTCTAA GAAACCATTA  
 8801 TTATCATGAC ATTAACCTAT AAAAATAGGC GTATCAGAG GCCCTTTCGT  
 8851 CC

Fig. 23

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puhd10-3-hIL3 Length: 3621

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1   ctcgagttaa ccactcccta tcagtgatag agaaaagtga aagtcgagtt
51  taccactccc tatcagtgat agagaaaagt gaaagtcgag ttaccactc
101 cctatcagtg atagagaaaa gtgaaaagtc agtttaccac tccctatcag
151 tgatagagaa aagtgaaggt caggtttacc actccctatc agtgatagag
201 aaaagtgaat gtcgagttaa ccactcccta tcagtgatag agaaaagtga
251 aagtcgagtt taccactccc tatcagtgat agagaaaagt gaaagtcgag
301 ctcggtaccc gggtcgagta ggcgtgtacg gtgggaggcc tatataagca
351 gagctcgttt agtgaaccgt cagatcgctt ggagacgcca tccacgctgt
401 tttgacctcc atagaagaca ccgggaccga tccagcctcc gcggccccga
451 attaaacagt cgagctacgt caacgaaaaa taaaatccaa acatgagccg
501 cctgcccgtc ctgctcctgc tccaactcct ggtccgcccc ggactccaag
551 ctcccatgac ccagacaacg tccttgaaga caagctgggt taactgctct
601 aacatgacgt atgaaattat aacacactta aagcagccac ctttgccctt
651 gctggacttc aacaacctca atggggaaga ccaagacatt ctgatggaaa
701 ataaccttcg aaggccaaac ctggaggcat tcaacagggc tgtcaagagt
751 ttacagaacg catcagcaat tgagagcatt cttaaaaatc tcctgccatg
801 tctgccctg gccacggccg caccacgcg acatccaatc catatcaagg
851 acggtgactg gaatgaattc cggaggaaac tgacgttcta tctgaaaacc
901 cttgagaatg cgcaggctca acagacgact ttgagcctcg cgatctttta
951 gaactcgact ctagacatga taagatacat tgatgagttt ggacaaaacc
1001 caactagaat gcagtgaata aaatgcttta tttgtgaaat ttgtgatgct
1051 attgctttat ttgtaacctt tataagctgc aataaacaag ttaacaacaa
1101 caattgcatt cattttatgt ttcaggttca gggggagggt tgggaggttt
1151 tttaaagcaa gtaaaacctc tacaatgtg gtatggctga ttatgacctc
1201 gcaagcctcg tegtctggcc ggaccacgct atctgtgcaa ggtccccgga
1251 cgcgcgctcc atgagcagag cgcccgccgc cgaggcaaga ctcgggcggc
1301 gccctgcccg tcccaccagg tcaacaggcg gtaaccggcc tcttcacggt
1351 gaatgcgcgc gaccttcagc atcgccggca tgtcccctgg cggacgggaa
1401 gtatcagctc gaccaagctt ggcgagattt tcaggagcta aggaagctaa
1451 aatggagaaa aaaatcactg gatataccac cgttgatata tcccaatggc
1501 atcgtaaaaga acatttttag gcattttcagt cagttgctca atgtacctat
1551 aaccagaccg ttcagctgca ttaatgaatc ggccaacgcg cggggagagg
1601 cggtttgctg attggcgctt cttccgcttc ctgctcact gactcgctgc
1651 gctcggtcgt tcggtcgctg cgagcggtat cagctcactc aaagtcggtt
1701 atacggttat ccacagaatc aggggataac gcaggaaaga acatgtgagc
1751 aaaaggccag caaaaggcca ggaaccgtta aaaggccgct ttgctggcgt
1801 ttttccatag gctccgcccc cctgacgagc atcacaaaaa tgcacgctca
1851 agtcagaggt ggcgaaaacc gacaggacta taaagatacc aggcgtttcc
1901 ccctggaagc tcctcgtgct gctctcctgt tccgacctcg ccgcttaccg
1951 gatacctgtc cgcttttctc ccttcgggaa gcgtggcgct tctcfaatgc
2001 tcacgctgta ggtatctcag ttcggtgtag gtcgttcgct ccaagctggg
2051 ctgtgtgcac gaaccccccg ttcagcccgga ccgctgccc tttatccggt
2101 actatcgtct tgagtccaac ccggttaagac acgacttatc gccactggaa
2151 gcagccactg gtaacaggat tagcagagcg aggtatgtag gcggtgctac
2201 agagttcttg aagtgggtgc ctaactacg ctacactaga aggacagtat
2251 ttggtatctg cgctctgctg aagccagtta ccttcggaaa aagagttggt
2301 agctcttgat ccggcaaaac aaccaccgct ggtagcgggt gttttttgt
2351 ttgcaagcag cagattacgc gcagaaaaaa aggatctcaa gaagatcctt
2401 tgatcttttc tacgggtctt gacgtcagat ggaacgaaaa ctacggttaa
2451 gggatttttg tcatgagatt atcaaaaagg atcttcacct agatcctttt
2501 aaattaaaaa tgaagtttta aatcaatcta aagtatatat gagtaaaact
2551 ggtctgacag ttaccaatgc ttaatcagtg aggcacctat ctacgcatc
2601 tgtctatttc gttcatccat agttgcctga ctccccgctg tgtagataac
2651 tacgatacgg gagggcttac catctggccc cagtgtgca atgataccgc
2701 gagaccacag ctacccggtt ccagatttat cagcaataaa ccagccagcc
2751 ggaaggggcg agcgcagaag tggctcctgca actttatccg cctccatcca
2801 gtctattaat tgttgccggg aagctagagt aagtagttcg ccagttaata
2851 gtttgccgaa cgttggtgcc attgctacag gcacgtgtg gtcacgctcg
2901 tcggttggtg tggtttcatt cagctccggt tcccaacgat caaggcgagt
2951 tacatgatcc cccatgttgt gcaaaaaagc ggttagctcc ttcggctctc
3001 cgatcgttgt cagaagtaag ttggccgag tgttatcact catggttatg
3051 gcagcactgc ataattctct tactgtcatg ccacccgtaa gatgcttttc
3101 tgtgactggt gagtactcaa ccaagtcatt ctgagaatag tgtatgcggc
3151 gaccgagttg ctcttgcccc tegtcaatac gggataatac cgcgccacat
3201 agcagaactt taaaagtgtc catcattgga aaacgttctt cggggcgaaa

```

Fig. 24



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```
3251 actctcaagg atcttaccgc tgttgagatc cagttcgatg taaccactc
3301 gtgcacccaa ctgatcttca gcatctttta ctttcaccag cgtttctggg
3351 tgagcaaaaa caggaaggca aaatgccgca aaaaagggaa taagggcgac
3401 acggaaatgt tgaataactca tactcttcct ttttcaatat tattgaagca
3451 tttatcaggg ttattgtctc atgagcggat acatatttga atgtatttag
3501 aaaaataaac aaataggggt tccgcgcaca tttccccgaa aagtgccacc
3551 tgacgtctaa gaaaccatta ttatcatgac attaacctat aaaaataggc
3601 gtatcacgag gccctttcgt c
```

Fig. 24

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pUHD10-3-hIL6

Length: 3752 June 22, 1999 10:32 Type: N Check: 8139 ..

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1   ctcgagttta ccactcccta tcagtgatag agaaaagtga aagtcgagtt
51  taccactccc tatcagtgat agagaaaagt gaaagtcgag tttaccacto
101 cctatcagtg atagagaaaa gtgaaaagtcg agtttaccac tccctatcag
151 tgatagagaa aagtgaaggt cgagtttacc actccctatc agtgatagag
201 aaaagtgaaa gtcgagttta ccactcccta tcagtgatag agaaaagtga
251 aagtcgagtt taccactccc tatcagtgat agagaaaagt gaaagtcgag
301 ctcggtaccc gggtcgagta ggctgtacg gtgggaggcc tatataagca
351 gagctcggtt agtgaaccgt cagatcgctt ggagacgcca tccacgctgt
401 tttgacctcc atagaagaca ccgggaccga tccagcctcc gcggtggcgg
451 ccgctctaga actagtggat cccccagctt acctgccatg ccagtacccc
501 caggagaaga ttccaaagat gtacgcgccc cacacagaca gccactcacc
551 tcttcagaac gaattgacaa acaaattcgg tacatcctcg acggcatctc
601 agccctgaga aaggagacat gtaacaagag taacatgtgt gaaagcagca
651 aagaggcact ggcagaaaaac aacctgaacc ttccaaagat ggctgaaaaa
701 gatggatgct tccaatctgg attcaatgag gagacttgcc tggtgaaaat
751 catcactggt cttttggagt ttgaggtata cctagagtac ctccagaaca
801 gatttgagag tagtgaggaa caagccagag ctgtccagat gagtacaaaa
851 gtccctgatcc agttcctgca gaaaaaggca aagaatctag atgcaataac
901 caccctgac ccaaccacaa atgccagcct gctgacgaag ctgcaggcac
951 agaaccagtg gctgcaggac atgacaactc atctcattct gcgcagcttt
1001 aaggagttcc tgcagtcag cctgagggct ctccggcaaa tgtagtaagg
1051 atccgaattc gagctcggtt cccggggatc ctctagagga tccagacatg
1101 ataagataca ttgatgagtt tggacaaaacc acaactagaa tgcagtgaaa
1151 aaaatgcttt atttgtgaaa tttgtgatgc tattgcttta tttgtaacca
1201 ttataagctg caataaaciaa gtttaacaaca acaattgcat tcattttatg
1251 tttcaggttc agggggagggt gtgggagggt ttttaaaagca agtaaaacct
1301 ctacaaatgt ggtatggctg attatgatcc tgcaagcctc gtcgtctggc
1351 cggaccaogc tatctgtgca aggtccccgg acgcgcgctc catgagcaga
1401 gcgcccgcgg ccgaggcaag actcggggcg cgcctgccc gtcccaccag
1451 gtcaacaggc ggtaacgggc ctcttcacgc ggaatgcgcg cgaccttcag
1501 catcgccggc atgtcccctg gcggacggga agtatcagct cgaccaagct
1551 tggcgagatt ttcaggagct aaggaagcta aaatggagaa aaaaatcact
1601 ggatatacca ccgttgatat atcccaatgg catcgtaaa aacattttga
1651 ggcatttcag tcagttgctc aatgtaccta taaccagacc gttcagctgc
1701 attaatgaat cggccaacgc gcggggagag gcggtttgcg tattgggchg
1751 tcttcgctt cctcgctcac tgactcgctg cgctcggtcg ttcggtgchg
1801 gcgagcggtt tcagctcact caaagtcggt aatacggtta tccacagaat
1851 caggggataa cgcaggaaag aacatgtgag caaaaggcca gcaaaaggcc
1901 aggaaccgta aaaaggccgc gttgctggcg tttttccata ggctccgccc
1951 cctgacgag catcacaaaa atcgacgctc aagtcagagg tggcgaaacc
2001 cgacaggact ataaagatac caggcgcttc cccctggaag ctccctcgctg
2051 cgctctctcg ttccgacctt gccgcttacc ggatacctgt ccgcctttct
2101 cccttcggga agcgtggcgc tttctcaatg ctacagctgt aggtatctca
2151 gttcggtgta ggtcgctcgc tccaagctgg gctgtgtgca cgaaccccc
2201 gttcagccc accgctgcgc cttatccggt aactatcgte ttgagtccaa
2251 cccggttaaga cagcacttat cgccactgga agcagccact ggtaacagga
2301 ttagcagagc gaggtatgta ggcggtgcta cagagttctt gaagtgttg
2351 cctaactacg gctacactag aaggacagta tttggtatct gcgctctgct
2401 gaagccagtt accttcggaa aaagagttgg tagctcttga tccggcaaac
2451 aaaccaccgc tggtagcggt ggtttttttg tttgcaagca gcagattacg
2501 cgcagaaaaa aaggatctca agaagatcct ttgatctttt ctacggggtc
2551 tgacgctcag tggaaacgaaa actcacgtta agggattttg gtcagagat
2601 tatcaaaaag gatcttcacc tagatccttt taaattaaaa atgaagtttt
2651 aaatcaatct aaagtatata tgagtaaaact tggctcgaca gttaccaatg
2701 cttaatcagt gaggcaccta tctcagcgat ctgtctattt cgttcatcca
2751 tagttgcctg actccccgtc gtgtagataa ctacgatacg ggagggctta
2801 ccatctggcc ccagtgtgct aatgataacc cgagacccac gctcaccggc
2851 tccagattta tcagcaataa accagccagc cgggaaggcc gagcgagaa
2901 gtggtcctgc aactttatcc gcctccatcc agtctattaa ttggtgccgg
2951 gaagctagag taagtagttc gccagttaat agtttgcgca acgttgttgc
3001 cattgctaca ggcacgtgtt ggtcacgctc gtcgtttggt atggcttcat
3051 tcagctccgg ttcccaacga tcaaggcgag ttacatgat ccccatgttg
3101 tgcaaaaaag cggttagctc cttcggtcct ccgacgttg tcagaagtaa
3151 gttggccgca gtgttatcac tcatggttat ggcagactg cataattctc

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```
3201 ttactgtcat gccatccgta agatgctttt ctgtgactgg tgagtactca
3251 accaagtcac tctgagaata gtgtatgcgg cgaccgagtt gctcttgccc
3301 gtcgtcaata cgggataata ccgcgccaca tagcagaact ttaaaagtgc
3351 tcatcattgg aaaacgttct tcggggcgaa aactctcaag gatcttacgg
3401 ctggtgagat ccagttcgat gtaaccact cgtgcaccca actgatcttc
3451 agcatctttt actttcacca gcgtttctgg gtgagcaaaa acaggaaggc
3501 aaaatgccgc aaaaaaggga ataaggcgca cacggaaatg ttgaatactc
3551 atactcttcc tttttcaata ttattgaagc atttatcagg gttattgtct
3601 catgagcgga tacatatttg aatgtattta gaaaaataaa caaatagggg
3651 ttccgcgcac atttccccga aaagtgccac ctgacgtcta agaaaccatt
3701 attatcatga cattaaccta taaaaatagg cgtatcacga ggccctttcg
3751 tc
```

Fig. 25

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puhd10-3-tgf

1 ctcgagtttaccactccctatcagtgatagagaaaagtgaaagtcgagtttaccactccc  
60  
61 tatcagtgatagagaaaagtgaaagtcgagtttaccactccctatcagtgatagagaaaa  
120  
121 gtgaaagtcgagtttaccactccctatcagtgatagagaaaagtgaaagtcgagtttacc  
180  
181 actccctatcagtgatagagaaaagtgaaagtcgagtttaccactccctatcagtgatag  
240  
241 agaaaagtgaaagtcgagtttaccactccctatcagtgatagagaaaagtgaaagtcgag  
300  
301 ctcggtacccgggtcgagtaggcgtgtacggtgggagcctatataagcagagctcgttt  
360  
361 agtgaaccgctcagatcgctggagacgccatccacgctgttttgacctccatagaagaca  
420  
421 ccgggacccgatccagcctccgcgccccgaattcctgcagcccATGCACTTGCAAAGGGC  
480  
481 TCTGGTAGTCCTGGCCCTGCTGAACTTGGCCACAATCAGCCTCTCTGTCTCACTTGAC  
540  
541 CACGTTGGACTTCGGCCACATCAAGAAGAAGAGGGTGGAAAGCCATTAGGGGACAGATCTT  
600  
601 GAGCAAGCTCAGGCTCACCAGCCCCCTGAGCCATCGGTGATGACCCACGTCCCCTATCA  
660  
661 GGTCTTGGCACTTTACAACAGCACCCGGGAGTTGCTGGAAGAGATGCACGGGGAGAGGGA  
720  
721 GGAAGGCTGCACTCAGGAGACCTCGGAGTCTGAGTACTATGCCAAAGAGATCCATAAATT  
780  
781 CGACATGATCCAGGGACTGGCGGAGCACAATGAACTGGCCGTCTGCCCCAAAGGAATTAC  
840  
841 CTCTAAGGTTTTTCGTTTCAATGTGTCTCAGTGGAGAAAAATGGAACCAATCTGTTCCG  
900  
901 GGCAGAGTTCCGGGTCTTGCGGGTGCCCAACCCAGCTCCAAGCGCACAGAGCAGAGAAT  
960  
961 TGAGCTCTTCCAGATACTTCGACCGGATGAGCACATAGCCAAGCAGCGCTACATAGGTGG  
1020  
1021 CAAGAATCTGCCCACAAGGGGCACCGCTGAATGGCTGTCTTTCGATGTCACTGACACTGT  
1080  
1081 GCGCGAGTGGCTGTTGAGGAGAGAGTCCAACCTTGGGTCTGGAATCAGCATCCACTGTCC  
1140  
1141 ATGTCACACCTTTCAGCCCAATGGAGACATACTGGAAAATGTTTCATGAGGTGATGGAAAT  
1200  
1201 CAAATTCAAAGGAGTGGACAATGAAGATGACCATGGCCGTGGAGACCTGGGGCGTCTCAA  
1260  
1261 GAAGCAAAAGGATCACCACAACCCACACCTGATCCTCATGATGATCCCCCACCACCGACT  
1320

Fig. 26

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1321 GGACAGCCCAGGCCAGGGCAGTCAGAGGAAGAAGAGGGCCCTGGACACCAATTACTGCTT  
 -----+-----+-----+-----+-----+ 1380  
 1381 CCGCAACCTGGAGGAGAACTGCTGTGTACGCCCCCTTATATTGACTTCCGGCAGGATCT  
 -----+-----+-----+-----+-----+ 1440  
 1441 AGGCTGGAAATGGGTCCACGAACCTAAGGGTTACTATGCCAACTTCTGCTCAGGCCCTTG  
 -----+-----+-----+-----+-----+ 1500  
 1501 CCCATACCTCCGCAGCGCAGACACAACCCATAGCACGGTGCTTGGACTATACAACACCCCT  
 -----+-----+-----+-----+-----+ 1560  
 1561 GAACCCAGAGGCGTCTGCCTCGCCATGCTGCGTCCCCCAGGACCTGGAGCCCCCTGACCAT  
 -----+-----+-----+-----+-----+ 1620  
 1621 CTTGTACTATGTGGGCAGAACCCCCAAGGTGGAGCAGCTGTCCAACATGGTGGTGAAGTC  
 -----+-----+-----+-----+-----+ 1680  
 1681 GTGTAAGTGCAGCTGAgggggatccactagtcttagaggatccagacatgataagataca  
 -----+-----+-----+-----+-----+ 1740  
 1741 ttgatgagtttggacaaaccacaactagaatgcagtgaaaaaatgctttatttgtgaaa  
 -----+-----+-----+-----+-----+ 1800  
 1801 tttgtgatgctattgctttatttgaaccattataagctgcaataaacaagttaacaaca  
 -----+-----+-----+-----+-----+ 1860  
 1861 acaattgcattcattttatgtttcaggttcagggggaggtgtgggaggttttttaagca  
 -----+-----+-----+-----+-----+ 1920  
 1921 agtaaaacctctacaaatgtggtatggctgattatgatcctgcaagcctcgctcgtctggc  
 -----+-----+-----+-----+-----+ 1980  
 1981 cggaccacgctatctgtgcaaggtccccggacgcgcgctccatgagcagagcgcccgccg  
 -----+-----+-----+-----+-----+ 2040  
 2041 ccgaggcaagactcgggcggcgcctgcccgtcccaccaggtcaacaggcggttaaccggc  
 -----+-----+-----+-----+-----+ 2100  
 2101 ctcttcacggaatgcgcgcgaccttcagcatcgccggcatgtcccctggcggacggga  
 -----+-----+-----+-----+-----+ 2160  
 2161 agtatcagctcgaccaagcttggcgagattttcaggagctaaggaagctaaaatggagaa  
 -----+-----+-----+-----+-----+ 2220  
 2221 aaaaatcactggatataaccacggttgatataatcccaatggcatcgtaagaacattttga  
 -----+-----+-----+-----+-----+ 2280  
 2281 ggcatttcagtcagttgctcaatgtacctataaccagaccgttcagctgcattaatgaat  
 -----+-----+-----+-----+-----+ 2340  
 2341 cggccaacgcgcggggagaggcggtttgcgtattggcgctcttccgcttcctcgctcac  
 -----+-----+-----+-----+-----+ 2400  
 2401 tgactcgctgcgctcggtcggttcggctgcggcgagcggtatcagctcactcaaagtcggt  
 -----+-----+-----+-----+-----+ 2460  
 2461 aatacggttatccacagaatcaggggataacgcaggaaagaacatgtgagcaaaaggcca  
 -----+-----+-----+-----+-----+ 2520  
 2521 gcaaaaggccaggaaacggtaaaaaggcgcggttgctggcggtttttccataggctccgccc  
 -----+-----+-----+-----+-----+ 2580  
 2581 ccctgacgagcatcacaaaaatcgacgctcaagtgcagaggtggcgaaacccgacaggact  
 -----+-----+-----+-----+-----+ 2640

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2641 ataaagataccaggcggtttccccctggaagctccctcgtagcgctctcctggtccgaccct 2700  
-----+-----+-----+-----+-----+  
2701 gccgcttaccggatacctgtccgcctttctcccttcgggaagcgtagcgctttctcaatg 2760  
-----+-----+-----+-----+-----+  
2761 ctcacgctgtaggtatctcagttcggtgtaggtcggtcccaagctgggctgtgtgca 2820  
-----+-----+-----+-----+-----+  
2821 cgaaccccccggttcagcccgaccgctgagccttatccggtaactatcgtcttgagtccaa 2880  
-----+-----+-----+-----+-----+  
2881 cccggtaagacacgacttatcgccactggaagcagccactggtaacaggattagcagagc 2940  
-----+-----+-----+-----+-----+  
2941 gaggtatgtaggcggtgctacagagttcttgaagtggtagcctaactacggctacactag 3000  
-----+-----+-----+-----+-----+  
3001 aaggacagtatttggtagctgtagctgaagccagttaccttcggaaaaagagttgg 3060  
-----+-----+-----+-----+-----+  
3061 tagctcttgatccggcaaaacaccacgctgtagcgggtggttttttgtttgcaagca 3120  
-----+-----+-----+-----+-----+  
3121 gcagattacgcgcagaaaaaaggatctcaagaagatcctttgatcttttctacggggtc 3180  
-----+-----+-----+-----+-----+  
3181 tgacgctcagtggaaacgaaaactcacgttaagggttttgggtcatgagattatcaaaaag 3240  
-----+-----+-----+-----+-----+  
3241 gatcttcacctagatccttttaattaaaaatgaagttttaaatcaatctaaagtatata 3300  
-----+-----+-----+-----+-----+  
3301 tgagtaaacttggtctgacagttaccaatgcttaatcagtgaggcacctatctcagcgat 3360  
-----+-----+-----+-----+-----+  
3361 ctgtctatttcggtcatccatagttgcctgactccccgctgtagataactacgatacg 3420  
-----+-----+-----+-----+-----+  
3421 ggagggcttaccatctggccccagtgctgcaatgataccgcgagaccacgctcaccggc 3480  
-----+-----+-----+-----+-----+  
3481 tccagatttatcagcaataaaccagccagccggaagggccgagcgcagaagtggctcctgc 3540  
-----+-----+-----+-----+-----+  
3541 aactttatccgcctccatccagttctattaattgttgccgggaagctagagtaagtagttc 3600  
-----+-----+-----+-----+-----+  
3601 gccagttaatagtttgcgcaacggtgttgccattgctacaggcatcgtgtggtcacgctc 3660  
-----+-----+-----+-----+-----+  
3661 gtcgtttggtatggcttcattcagctccggttcccaacgatcaaggcgagttacatgatc 3720  
-----+-----+-----+-----+-----+  
3721 ccccatgttgcaaaaaagcgggttagctccttcggtcctccgatcgttgtcagaagtaa 3780  
-----+-----+-----+-----+-----+  
3781 gttggccgcagtggttatcactcatggttatggcagcactgcataattctcttactgtcat 3840  
-----+-----+-----+-----+-----+  
3841 gccatccgtaagatgcttttctgtgactggtgagtactcaaccaagtcattctgagaata 3900  
-----+-----+-----+-----+-----+  
3901 gtgtatgcccgcagcgagttgctcttgcccgtcgtcaatacgggataataccgcgccaca 3960  
-----+-----+-----+-----+-----+  
tagcagaactttaaaagtgtcatcattggaacggttcttcggggcgaaaactctcaag

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3961 -----+-----+-----+-----+-----+ 4020  
gatcttaccgctgttgagatccagttcgatgtaacccactcgtgcacccaactgatcttc  
4021 -----+-----+-----+-----+-----+ 4080  
agcatcttttactttcaccagcggttctgggtgagcaaaaacaggaaggcaaaatgccgc  
4081 -----+-----+-----+-----+-----+ 4140  
aaaaaaggggaataagggcgacacggaaatggtgaatactcatactcttcctttttcaata  
4141 -----+-----+-----+-----+-----+ 4200  
ttattgaagcatttatcaggggttattgtctcatgagcggatacatatttgaatgtattta  
4201 -----+-----+-----+-----+-----+ 4260  
gaaaaataaacaatataggggttccgcgcacatttccccgaaaagtgccacctgacgtcta  
4261 -----+-----+-----+-----+-----+ 4320  
agaaaccattattatcatgacattaacctataaaaataggcgtatcacgaggccctttcg  
4321 -----+-----+-----+-----+-----+ 4380  
tc  
4381 -- 4382

Fig. 26



pUHD10.3-hft3 Ligand-exon 6 plasmid Length: 4224

1 CTCGAGTTTA CCACTCCCTA TCAGTGATAG AGAAAAGTGA AAGTCGAGTT  
 51 TACCACTCCC TATCAGTGAT AGAGAAAAGT GAAAGTCGAG TTTACCACTC  
 101 CCTATCAGTG ATAGAGAAAA GTGAAAGTCG AGTTTACCAC TCCCTATCAG  
 151 TGATAGAGAA AAGTGAAAGT CGAGTTTACC ACTCCCTATC AGTGATAGAG  
 201 AAAAGTGAAA GTCGAGTTTA CCACTCCCTA TCAGTGATAG AGAAAAGTGA  
 251 AAGTCGAGTT TACCACTCCC TATCAGTGAT AGAGAAAAGT GAAAGTCGAG  
 301 CTCGGTACCC GGGTCGAGTA GCGGTGTACG GTGGGAGGCC TATATAAGCA  
 351 GAGCTCGTTT AGTGAACCGT CAGATCGCCT GGAGACGCCA TCCACGCTGT  
 401 TTTGACCTCC ATAGAAGACA CCGGGACCGA TCCAGCCTCC GCGGCCCCGA  
 451 ATTCCggggc ccccgccga aATGacagtg ctggcgccag cctggagccc  
 501 aacaacctat ctctctctgc tgctgtctgt gagctcgga ctgagtgga  
 551 cccaggactg ctcttccaa cacagccca tctctccga ctgctgtc  
 601 aaaatccgtg agctgtctga ctacctgtt caagattacc cagtcaccgt  
 651 ggcctccaac ctgcaggacg aggagctctg cgggggcctc tggcggtg  
 701 tctggcaca gcgtggatg gagcggctca agactgtgc tgggtccaag  
 751 atcaaggct tctggagcg cgtgaacacg gagataact ttgtaccaa  
 801 atgtgcctt cagcccccc ccagctgtt tgcctcgtc cagaccaaca  
 851 tctccgcct cctgcaggag acctccgagc agctgggtgc gctgaagccc  
 901 tggatcactc gccagaactt ctcccggtgc ctggagctgc agtgcagcc  
 951 cgtagagacg gtgtttacc gtgtcagcca ggatggtctc gatctctga  
 1001 cctcgTGAtc tgcccgcctc ggcctcccaa agtgctagga ttacagatac  
 1051 tctcaaccc tgccacccc atggagtcct cggcccctgg aggccacagc  
 1101 cccgacagcc ccgagcccc ctctgtctct cctactgtg ctgccgtgg  
 1151 gctctctgt gctggccgct gcctgggtgc tgcactggca gaggacgagg  
 1201 cggaggacac cccgccctgg ggagcaggtg ccccccgtcc ccagtcccca  
 1251 ggacctgtg ctgtggagc actgacctgg ccaaggcctc atcctcgga  
 1301 gccttaaca acgcagtga acagacatct atcatccat ttacagggg  
 1351 aggatactga ggcacacaga ggggagtcac cagccagagg atgtatagcc  
 1401 tggacacaga ggaagtggc tagaggccgg tccctctctt gggcccctct  
 1451 cattccctcc ccagaatga ggcaacgcca gaatccagca ccggccccat  
 1501 ttacccaact ctgaacaaag cccCCGGAAT TCGAGCTCGG TACCCGGGGA

Fig. 26a

1551 TCCTCTAGAG GATCCAGACA TGATAAGATA CATTGATGAG TTTGGACAAA  
1601 CCACAAC TAG AATGCAGTGA AAAAAATGCT TTATTTGTGA AATTTGTGAT  
1651 GCTATTGCTT TATTTGTAA CATTATAAGC TGCAATAAAC AAGTTAACAA  
1701 CAACAATTGC ATTCATTTTA TGTTCAGGT TCAGGGGGAG GTGTGGGAGG  
1751 TTTTTTAAAG CAAGTAAAC CTCTACAAAT GTGGTATGGC TGATTATGAT  
1801 CCTGCAAGCC TCGTCGTCTG GCCGGACCAC GCTATCTGTG CAAGGTCCCC  
1851 GGACGCGCGC TCCATGAGCA GAGCGCCCGC CGCCGAGGCA AGACTCGGGC  
1901 GGCGCCCTGC CCGTCCCACC AGGTCAACAG GCGGTAACCG GCCTCTTCAT  
1951 CGGGAATGCG CGCGACCTTC AGCATCGCCG GCATGTCCCC TGGCGGACGG  
2001 GAAGTATCAG CTCGACCAAG CTTGGCGAGA TTTTCAGGAG CTAAGGAAGC  
2051 TAAAATGGAG AAAAAAATCA CTGGATATAC CACCGTTGAT ATATCCCAAT  
2101 GGCATCGTAA AGAACATTTT GAGGCATTTT AGTCAGTTGC TCAATGTACC  
2151 TATAACCAGA CCGTTCAGCT GCATTAATGA ATCGGCCAAC GCGCGGGGAG  
2201 AGGCGGTTTG CGTATTGGGC GCTCTTCCGC TTCCTCGCTC ACTGACTCGC  
2251 TGCGCTCGGT CGTTCGGCTG CGGCGAGCGG TATCAGCTCA CTCAAAGGCG  
2301 GTAATACGGT TATCCACAGA ATCAGGGGAT AACGCAGGAA AGAACATGTG  
2351 AGCAAAAGGC CAGCAAAAGG CCAGGAACCG TAAAAAGGCC GCGTTGCTGG  
2401 CGTTTTTCCA TAGGCTCCGC CCCCTGACG AGCATCACAA AAATCGACGC  
2451 TCAAGTCAGA GGTGGCGAAA CCCGACAGGA CTATAAAGAT ACCAGGCGTT  
2501 TCCCCCTGGA AGCTCCCTCG TGCGCTCTCC TGTTCCGACC CTGCCGCTTA  
2551 CCGGATACCT GTCCGCCTTT CTCCCTTCGG GAAGCGTGGC GCTTTCTCAA  
2601 TGCTCACGCT GTAGGTATCT CAGTTCGGTG TAGGTCGTTT GCTCCAAGCT  
2651 GGGCTGTGTG CACGAACCCC CCGTTCAGCC CGACCGCTGC GCCTTATCCG  
2701 GTAACATCG TCTTGAGTCC AACCCGGTAA GACACGACTT ATCGCCACTG  
2751 GCAGCAGCCA CTGGTAACAG GATTAGCAGA GCGAGGTATG TAGGCGGTGC  
2801 TACAGAGTTC TTGAAGTGGT GGCCTAACTA CGGCTACACT AGAAGGACAG  
2851 TATTTGGTAT CTGCGCTCTG CTGAAGCCAG TTACCTTCGG AAAAAGAGTT  
2901 GGTAGCTCTT GATCCGGCAA ACAAACCACC GCTGGTAGCG GTGGTTTTTT  
2951 TGTTTGCAAG CAGCAGATTA CGCGCAGAAA AAAAGGATCT CAAGAAGATC  
3001 CTTTGATCTT TTCTACGGGG TCTGACGCTC AGTGGAACGA AAACCTCACGT  
3051 TAAGGGATTT TGGTCATGAG ATTATCAAAA AGGATCTTCA CCTAGATCCT  
3101 TTTAAATTAA AAATGAAGTT TTAAATCAAT CTAAAGTATA TATGAGTAAA  
3151 CTTGGTCTGA CAGTTACCAA TGCTTAATCA GTGAGGCACC TATCTCAGCG

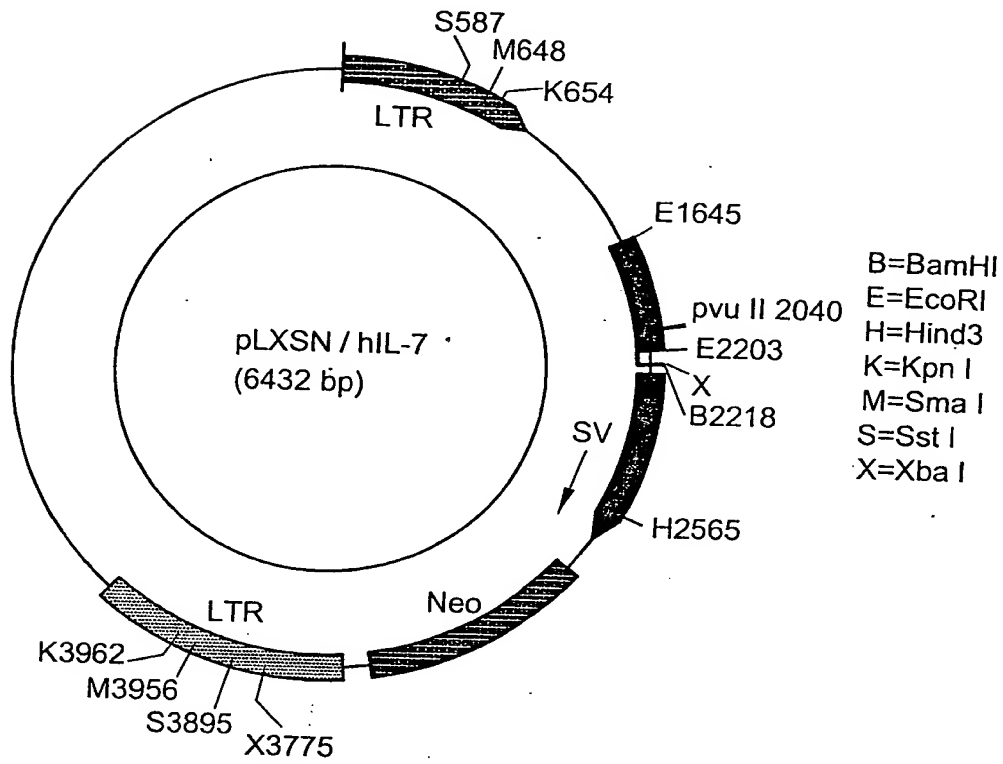
Fig. 26a

3201 ATCTGTCTAT TTCGTTTCATC CATAGTTGCC TGA CTCCCCG TCGTG TAGAT  
3251 AACTACGATA CGGGAGGGCT TACCATCTGG CCCAGTGCT GCAATGATAC  
3301 CGCGAGACCC ACGCTCACCG GCTCCAGATT TATCAGCAAT AAACCAGCCA  
3351 GCCGGAAGGG CCGAGCGCAG AAGTGGTCCT GCAACTTTAT CCGCCTCCAT  
3401 CCAGTCTATT AATTGTTGCC GGGAAGCTAG AGTAAGTAGT TCGCCAGTTA  
3451 ATAGTTTGCG CAACGTTGTT GCCATTGCTA CAGGCATCGT GGTGTCACGC  
3501 TCGTCGTTTG GTATGGCTTC ATTCAGCTCC GGTCCCAAC GATCAAGGCG  
3551 AGTTACATGA TCCCCATGT TGTGCAAAAA AGCGGTTAGC TCCTTCGGTC  
3601 CTCCGATCGT TGTCAGAAAGT AAGTTGGCCG CAGTGTTATC ACTCATGGTT  
3651 ATGGCAGCAC TGCATAATTC TCTTACTGTC ATGCCATCCG TAAGATGCTT  
3701 TTCTGTGACT GGTGAGTACT CAACCAAGTC ATTCTGAGAA TAGTGTATGC  
3751 GGCGACCGAG TTGCTCTTGC CCGGCGTCAA TACGGGATAA TACCGCGCCA  
3801 CATAGCAGAA CTTTAAAAGT GTCATCATT GGAAAACGTT CTTCGGGGCG  
3851 AAAACTCTCA AGGATCTTAC CGCTGTTGAG ATCCAGTTCG ATGTAACCCA  
3901 CTCGTGCACC CAACTGATCT TCAGCATCTT TTTACTTTTAC CAGCGTTTCT  
3951 GGGTGAGCAA AAACAGGAAG GCAAATGCC GCAAAAAGG GAATAAGGGC  
4001 GACACGGAAA TGTTGAATAC TCATACTCTT CCTTTTTCAT TATTATTGAA  
4051 GCATTTATCA GGGTTATTGT CTCATGAGCG GATACATATT TGAATGTATT  
4101 TAGAAAAATA AACAAATAGG GGTCCGCGC ACATTTCCCC GAAAAGTGCC  
4151 ACCTGACGTC TAAGAAACCA TTATTATCAT GACATTAACC TATAAAAATA  
4201 GGCGTATCAC GAGGCCCTTT CGTC

Fig. 26a

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Recovery of insert: EcoRI



Ref. (HSIL7A)  
 Insert:375(-10)  
 E

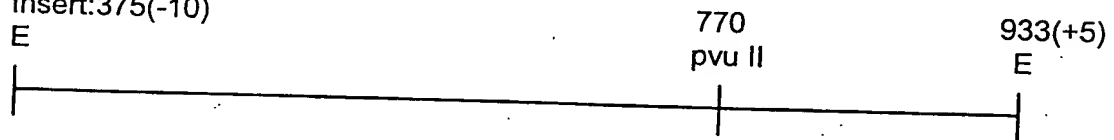
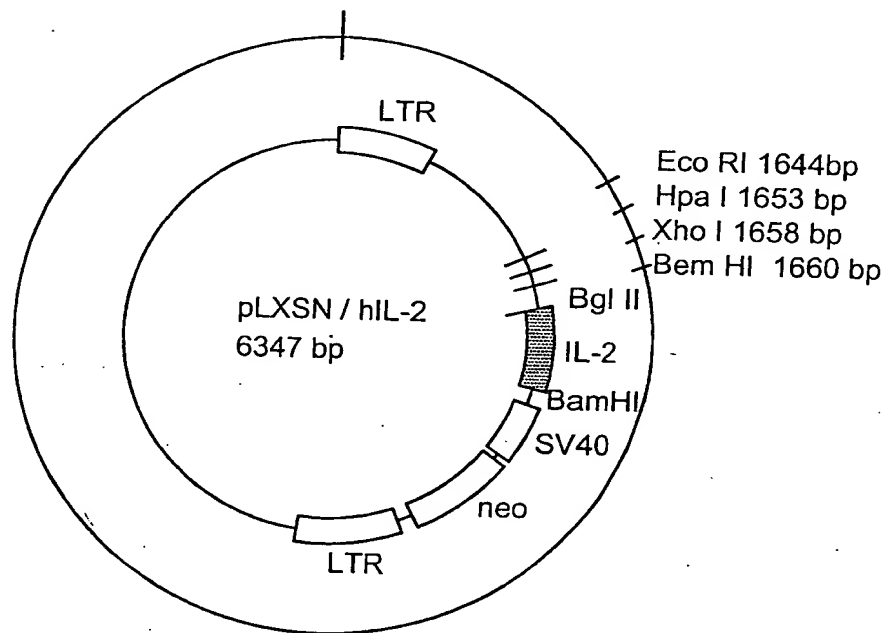


FIG.27

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## Plasmid-chart

|                     |                 |            |                                     |
|---------------------|-----------------|------------|-------------------------------------|
| Designation:        | pLXSN/hIL-2     | Log no.:   |                                     |
| Insert:             | hIL-2 (473bp)   | Location:  |                                     |
| Vector:             | pLXSN (5874bp)  | Selection: | Amp                                 |
| Recovery of insert: | Eco RI / Bam HI | Ref.:      | pLXSN BioTechniques 7,980-987(1989) |
|                     | Hpa I / Bam HI  |            | hIL-2 Nature 302,305-309(1983)      |
|                     | Xho I / Bam HI  |            |                                     |



Insert: Bgl II  
 5' AGA TCT ACA - IL-2 - TAA TTA AGT BamHI 473 bp

FIG.28